4.0 AFFECTED ENVIRONMENT

The Affected Environment section provides a description of the existing environmental resources in and around the project area that would potentially be affected for the alternatives under consideration, including the Preferred Alternative. This section describes baseline conditions of relevant resources and provides a basis of comparison to determine the potential environmental consequences of the proposed project alternatives on these baseline conditions. This section includes the items and order required in Florida Department of Transportation (FDOT) Part 1, Chapter 8 of the *Project Development and Environment Manual (PD&E Manual).* Specifically, the Affected Environment section contains three general categories: Social and Economic Resources, Cultural and Historic Resources, and Natural and Physical Resources. Individual resources (e.g., wetlands, archaeological, and floodplains) are subsections of these three general categories. Each of these categories and subcategories, and the specific impacts of the Preferred Alternative (Alternative 1C) are discussed in the same order in Section 5.0 (Environmental Consequences).

4.1 Social and Economic Resources

4.1.1 Sociocultural Effects Evaluation

A number of federal statutes, regulations, policies, technical advisories and Executive Orders support and implement the National Environmental Policy Act of 1969 (NEPA) to evaluate the social and cultural effects of transportation projects. Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, requires all federal agencies to identify and address disproportionate and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. EO 12898 also directs federal agencies to incorporate environmental justice into their overall missions by conducting their programs and activities in a manner that provides minority and low-income populations an opportunity to participate in agency programs and decisions. EO 12898 relates to the requirements in Title VI of the Civil Rights Act of 1964 (Title VI), NEPA, the Uniform Relocation Assistance and Real Property Acquisition Act [49 Code of Federal Regulations (CFR) Part 24], and other applicable statutes and regulations. Title VI of the Civil Rights Act of 1964 and other federal and state nondiscrimination laws provide that no person will, on the grounds of race, color, religion, sex, national origin, marital status, disability, or family status, be excluded from participation in, be denied the benefits of, or be otherwise subject to discrimination under any program of the federal, state, or local government. Title VIII of the 1968 Civil Rights Act guarantees each person equal opportunity in housing. U.S. Department of Transportation (USDOT) Order 5610.2, *Environmental Justice in Minority Populations and Low-Income Populations*, was issued to implement EO 12898.

In addition to the above federal orders and regulations, NEPA requires that agencies consider the potential effects of transportation actions on the human environment. These actions can have major influences on society, often with significant economic and social effects. A Sociocultural Effects (SCE) Evaluation was prepared in accordance with the *PD&E Manual*, Part 2, Chapter 9, and the FDOT *SCE Handbook*. Chapter 9 provides guidance on the implementation of these various orders and regulations. Details of the evaluation are contained in the technical support document titled *Sociocultural Effects Report*.

The SCE Evaluation is the process of determining and evaluating the effects that a transportation action may have on a community and the quality of life of its citizens. It is a proactive process that ensures that community values and concerns receive adequate attention during transportation project development. The process focuses on a transportation project's potential effects on social, economic, land use, mobility, aesthetic, and relocation issues. The SCE study area (**Figure 4.1**) is defined as a 1-mile area surrounding all of the alternatives, modified slightly to include community services on the south side of Port St. Lucie Boulevard, the east side of U.S. 1, the north side of Prima Vista Boulevard, and the west side of Airoso Boulevard. Although the county and municipal boundaries could be used to define the limits of a community, GIS analysis and field verification of the census tracts indicates that the census tracts provide a more representative demarcation of communities within the SCE study area. Additionally, an interview with City of Port St. Lucie (City) staff confirmed that except for La Buona Vita east of the North Fork St. Lucie River (NFSLR), and Villas of Village Green in the southwest corner of Midport Road and U.S. 1, there are no formal or informal Property/Home Owners Associations or groups that further define communities within the project area.

4.1.1.1 Existing Sociocultural Conditions

The post-World War II development of St. Lucie County (County) is similar to that of the rest of America with increasing numbers of automobiles, development of an interstate highway system, suburban sprawl, and strip development along major state highways. The City was incorporated in 1961 by the General Development Corporation. From a population of 330 residents in 1970, the City grew to more than 55,000 in 20 years. In 2000, the population was approximately 89,000 and in 2010, the City's population was approximately 165,000, an increase of 85.4 percent since the Year 2000 Census.

A Community Characteristics Inventory (CCI) was developed for each defined community within the study area. A CCI is a comprehensive summary of the quantitative and qualitative data on a potentially affected community. Community resources (**Figure 4.2**) were inventoried within the study area and are detailed in the *Sociocultural Effects Report.* Many of these community facilities are also community focal points, including several parks and recreation areas. Potential involvement with archaeological and historic resources was examined and summarized in the *Cultural Resource Assessment Survey Report* and is also discussed in Section 4.2.1 (Archaeological and Historical).

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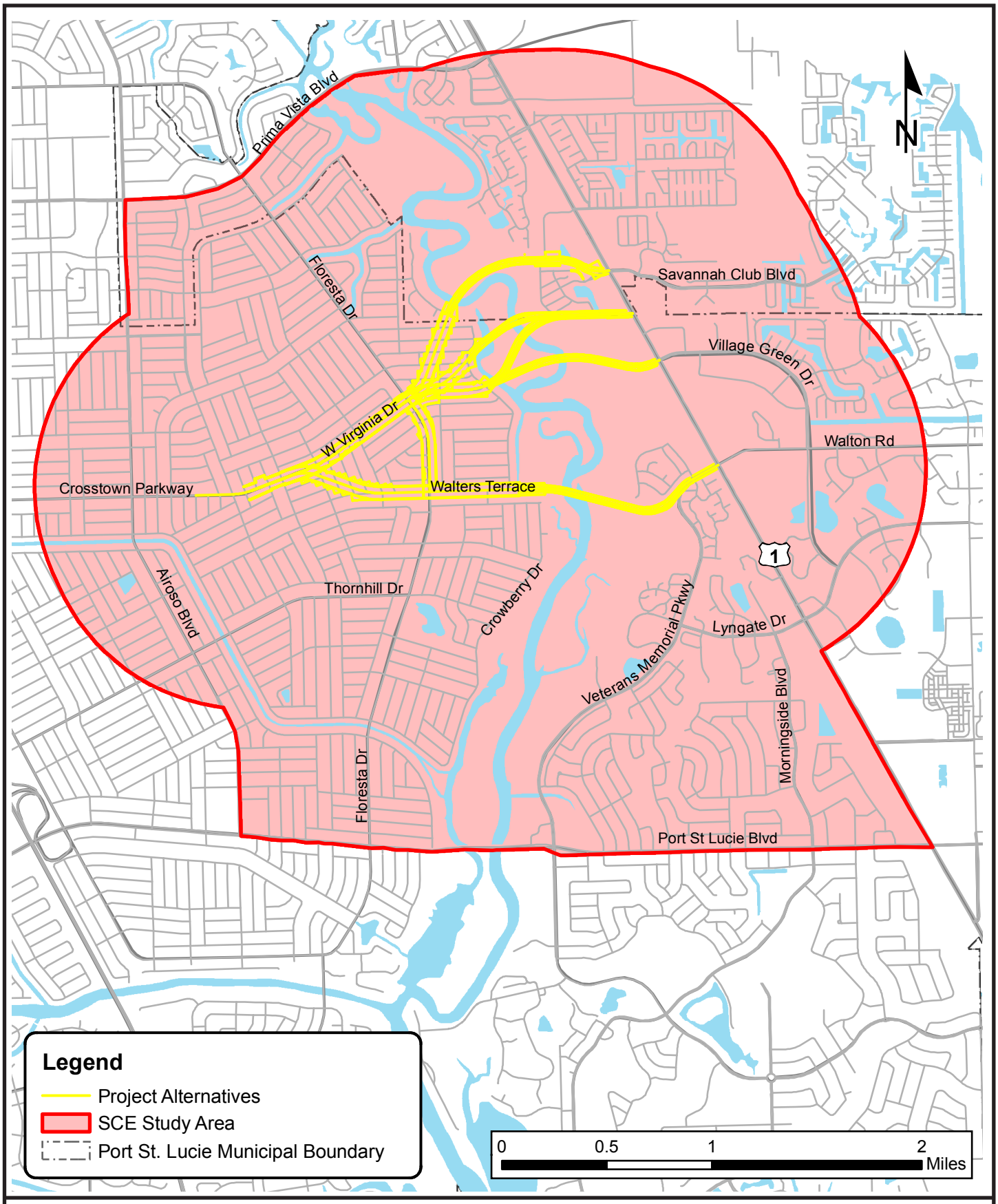

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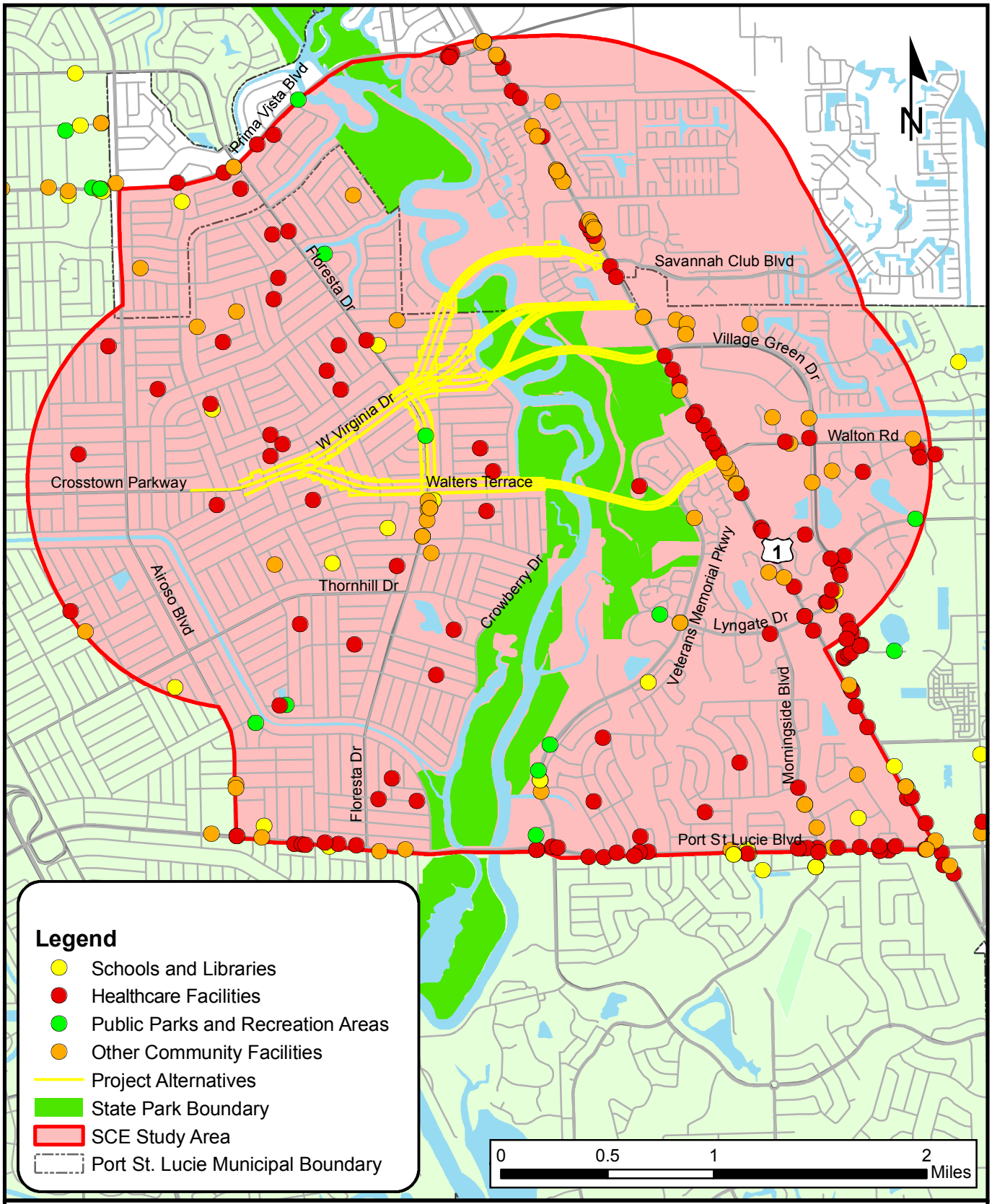
SCE Study Area

Figure 4.1



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Community Facilities
Figure 4.2

The purpose of the SCE Evaluation is to characterize the human environment within the project area. The SCE study area intersects seven census tracts (**Figure 4.3**). However, the build alternatives, including the Preferred Alternative, lie within Census Tracts 20.01, 20.02, and 20.03. In addition to the demographic information collected from census data, personal interaction of project team members with the community assisted in determining potential impacts of the project on elderly, handicapped, and minority populations. For example, a series of public meetings were held, which provided the project team with an opportunity to interact with those residents within the project area and to identify if any disadvantaged groups (or representatives of such groups) reside in the study area, and/or if the residents present at those meetings had concerns about impacts that the project may have on any disadvantaged populations that might reside in the project area. Those meetings included the following:

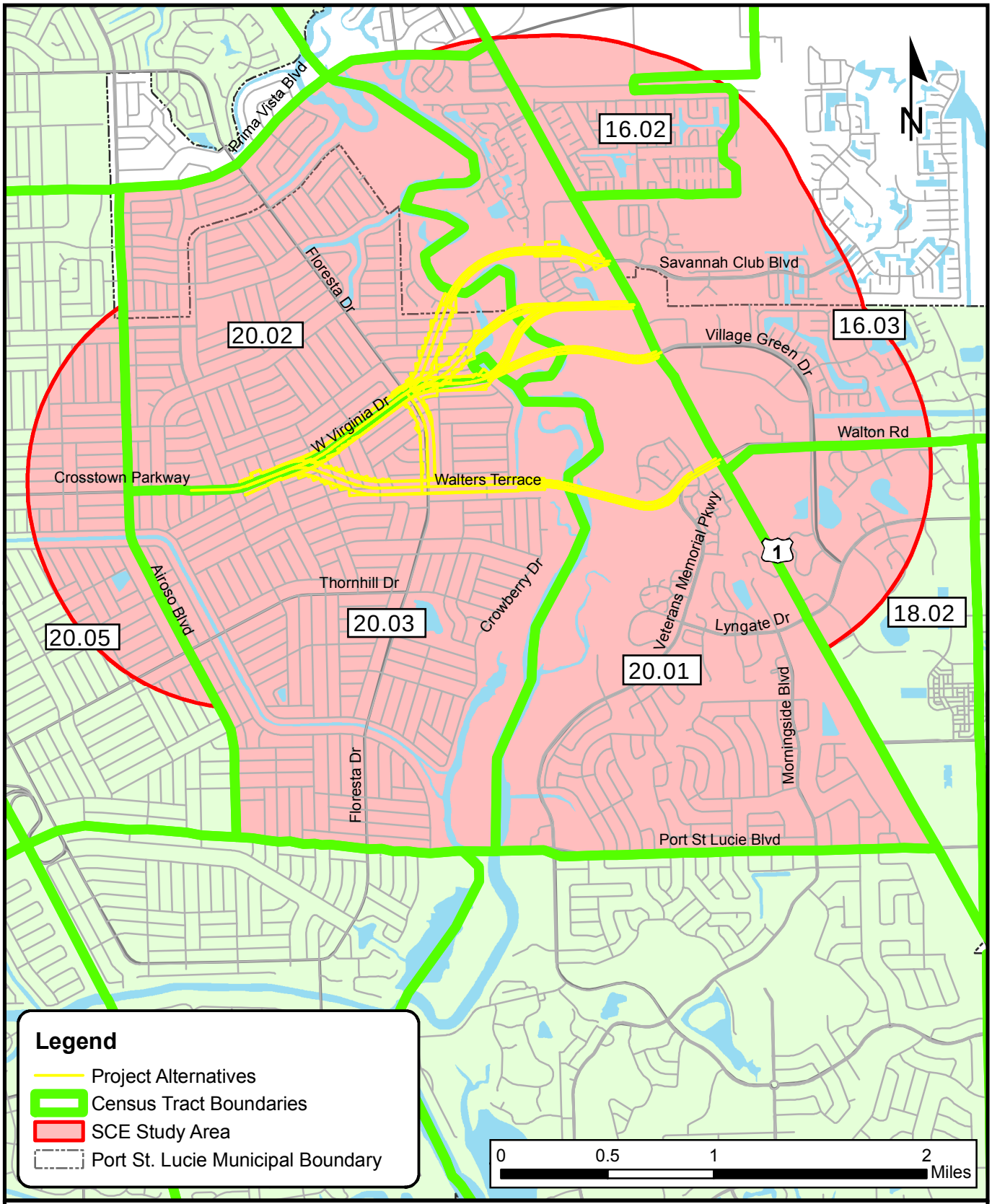
**Photo 4.1 Alternatives Public Workshop
June 4, 2009**

- Corridor Public Kick-off Meeting – June 5, 2003;
- La Buona Vita Homeowners Meeting – April 19, 2004;
- Homeowners Meeting – April 22, 2004;
- Citizens Discussion Group Meeting – January 26, 2005;
- Public Meeting – March 23, 2005;
- Public Kick-off Meeting – July 10, 2008;
- Cul-de-sac Meeting – April 28, 2009;
- Alternatives Public Workshop – June 4, 2009;
- Public Hearing –- September 22, 2011.

Information including meeting minutes and comments received from these meetings can be found in Section 8.0 (Comments and Coordination) and **Appendix I**. Site visits and observations within the study area have been conducted throughout the course of the project (since 2003) to collect existing data about the study area.

Demographic data describe the community's population and describe population size, gender, age composition, ethnic backgrounds, household characteristics, and geographic distribution. The technical support document titled *Sociocultural Effects Report,* and Section 5.1.1 (Sociocultural Effects Evaluation) of this EIS, presents a breakdown of the demographic characteristics of the study area by census tract, as well as a comparison of the demographic impacts for each alternative for each census tract.

The census data show a difference in demographic structure between the communities east and west of the NFSLR. The communities on the west side of the River (Census Tracts 20.02 and 20.03); appear to be somewhat more affluent (over 103 percent of the median family income for the County) and on average, more mobile (approximately 20 percent of the households have more than three vehicles per household versus less than 15 percent on the east side). Most live in owner-occupied single-family homes that are over 104 percent of the median home value for the County.



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Census Tracts
Figure 4.3

On the east side of the River, west of U.S. 1 (Census Tract 20.01), there is a mixture of single-family, multi-family, and mobile homes. There are fewer owner-occupied homes and more renters. The community is somewhat less affluent with 88 percent of the median family income living in homes that are 69 percent of the median home value for the County. The minority population is approximately 24 percent of the total population; the poverty rate is approximately 12 percent.

Ms. Tricia Pollard, the City's Community Services Director was interviewed (October 6, 2010) to identify known disadvantaged populations located in the study area. Ms. Pollard indicated that existing census data are the base information used by its agency to help identify low income areas. The U.S. Department of Housing and Urban Development (HUD) defines a low-income household as a household where the annual income does not exceed 80 percent of the area's median income, and defines the threshold for identifying low/moderate income areas as a block group where more than 50 percent of the households in that area have low/moderate incomes. Ms. Pollard explained that the City obtained an exception to the 50 percent criterion, and that low/moderate income areas within the City are those where 45.2 percent (or more) are low income households. Using the 2000 Census data available during the time of the interview, the City identified 11 census tract block groups that meet or exceed the City's low/moderate income criteria. These block groups are those areas where the City applies funding from HUD's Community Development Block Grant Program. Census race ethnicity information has not been available at the census tract level which would allow the City to update this information.

Ms. Pollard noted there is one community (Villas of Village Green) within the project area that was identified by the City as a low/moderate income community based on the City's criterion. It is located southeast of Veterans Memorial Parkway, just west of U.S. 1. Alternatives 2A and 2D pass north of the Villas of Village Green and tie into the existing alignment of Veterans Memorial Parkway. The Villas of Village Green has a formal Property Owners Association. The other ten low/moderate income areas are located outside the project area.

According to the 2010 Census, minority populations are present in all census tracts with Hispanics making up the greatest percentage (compared to Black/African American or Native American/Alaskan Native). **Table 4.1** shows the minority populations and income level for each of the census tracts and for the overall County in the project area. In addition to the information contained in the census data, research and public outreach did not identify the presence of any specific areas of disadvantaged populations in the study area.

Table 4.1 Minority Populations and Income Level for Project Area Census Tracts

Tract Data	Tract 20.01	Tract 20.02	Tract 20.02	County
Population	6,417	6,904	8,802	277,789
Black or African American	12.2%	6.3%	7.7%	19.1%
Native American and Alaskan Native	0.2%	0.9%	1.2%	0.4%
Hispanic	11.9%	32.4%	14.4%	16.6%
Median Family Income (MFI)	$45,625	$53,507	$55,812	$51,943

The data collected within the study area neighborhoods and during the project's public involvement activities, summarized above and provided in detail in Section 8.0 (Comments and Coordination), did not indicate a concentration of ethnic groups in individual neighborhoods or areas existing in the project area where there were concentrations of minority residents.

An analysis of the data used to characterize the project area indicates there is a high concentration of mobile homes and a high number of multi-family residential units east of U.S. 1. These areas, which are east of the project area, also are characterized by having Median Family Incomes lower than the region's Median Family Income, areas with a higher percentage of minorities than the County average, areas with persons older than 65 years, and areas with higher than the County average of disabled persons. Conversely, the area west of the NFSLR within the project area has high numbers of single-family homes, which appear to have the opposite characteristics. With the exception of La Buona Vita community (which has a high percentage of persons older than 65 years), no concentrations of racial, ethnic, age groups, or disabled groups exist within the project area.

4.1.1.2 Existing Land Uses

Existing land uses in the study area west of the U.S. 1 are primarily residential with a few small commercial nodes (**Appendix J**). Property along Port St. Lucie Boulevard and U.S. 1 exhibit a "strip commercial" pattern. Much of the land directly adjacent to the NFSLR is state-owned park and recreation lands. Along the west side of U.S. 1, existing commercial land uses are located immediately adjacent to U.S. 1 and residential land uses further west along the NFSLR. Institutional and service land uses are scattered throughout the U.S. 1 corridor. Along the east side of U.S. 1, commercial land uses are located immediately adjacent to U.S. 1, with an industrial node along Village Green Drive. Other uses along U.S. 1 include service, utility, and government land uses. Between U.S. 1 and the Indian River Lagoon/Intracoastal Waterway, much of the existing land use is residential. The balance of the land use consists of governmental use, commercial, industrial, and agriculture. Approximately 5 percent of the land east of the NFSLR within the study area is vacant and could potentially be developed (non-publicly-owned lands), while approximately 6.5 percent of the land west of the NFSLR is vacant and could potentially be developed.

Current land use patterns within the SCE study area are consistent with the City of Port St. Lucie Comprehensive Plan (Comprehensive Plan) and Future Land Use Map. The Crosstown Parkway Extension project is compatible with the Comprehensive Plan (Transportation Element), which identified the Crosstown Parkway as an east-west corridor crossing the NFSLR and connecting to U.S. 1[1]. The majority of the land shown in the Comprehensive Plan's corridor is held in public ownership as part of the Savannas Preserve State Park and the NFSLR Aquatic Preserve. Some of the area located between U.S. 1 and the NFSLR and north of Port St. Lucie Boulevard is located in what the City defines as a "Coastal Planning Area" in the Comprehensive Plan. Within the Coastal Planning Area is the category of "Coastal High Hazard Area" (CHHA). The Comprehensive Plan identifies the CHHA as the Category 1 Storm Surge Evacuation Area; the St. Lucie County Comprehensive Plan also identified the CHHA along the NFSLR as a Category 1 Storm Surge Evacuation Zone.

[1] Shown as a new/improved 6-lane corridor on Map #8 in the Future Transportation Map Series.

4.1.1.3 Consistency with Local Comprehensive Plans

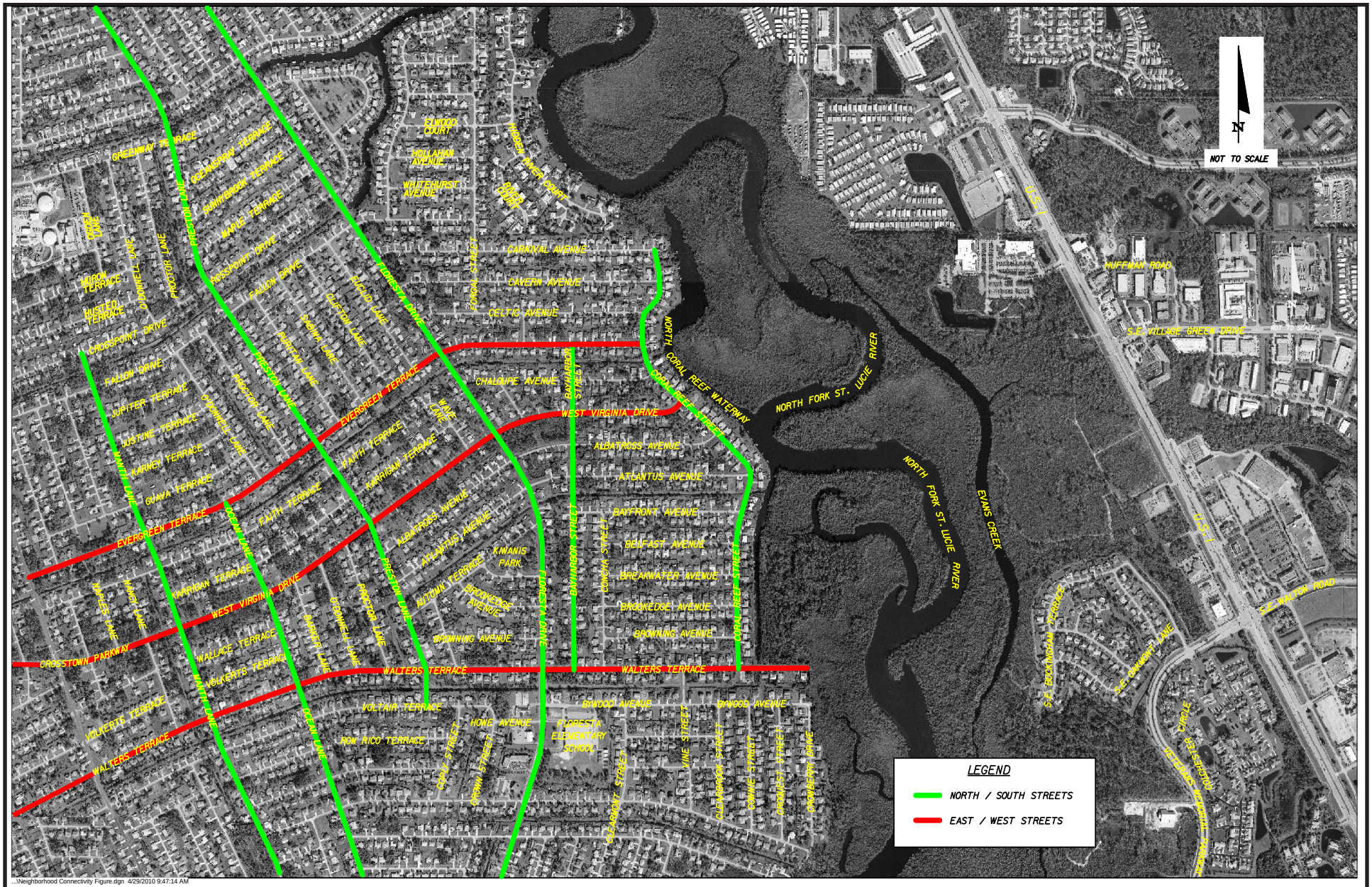
Policy 5.1.3.2 of the Comprehensive Plan states that for lands meeting the criteria for a CHHA, the City shall designate them as such to limit development in these areas and to identify management techniques for relocating infrastructure away from such areas, except for areas determined to have vested development rights. Most of these lands are held in public ownership as part of the Savannas Preserve State Park and as the NFSLR Aquatic Preserve. Policy 5.1.3.3 states that except for those properties with vested rights, the City will limit land use densities and direct infrastructure improvements away from the CHHA through the implementation of the land development code. The study limits for CHHA includes the area within the project area. The 2035 Regional Long Range Transportation Plan (RLRTP) has identified proposed new transit routes along Port St. Lucie Boulevard and Crosstown Parkway; proposed multipurpose trails along Prima Vista Boulevard and Port St. Lucie Boulevard; and a priority bicycle corridor along Crosstown Parkway.

4.1.1.4 Transit and Mobility

The major roadways providing regional connectivity within the project area are Port St. Lucie Boulevard, U.S. 1, Prima Vista Boulevard, and Airoso Boulevard. Several smaller roadways make up the transportation system within the neighborhoods between Manth Lane and the NFSLR. All are 2-lane local residential streets laid out in irregular patterns. A limited number of north-south streets provide continuity and connectivity within the local area: Manth Lane, Preston Lane, and Floresta Drive. A canal located south of and parallel to Walters Terrace limits north-south connectivity (**Figure 4.4**). In addition, Ocean Lane provides north-south continuity from Evergreen Terrace southward, connecting the southern two-thirds of the study area to the areas south of the study area; Coral Reef Street provides north-south continuity between Carnival Avenue and Walters Terrace; and Bayharbor Street provides north-south continuity between Evergreen Terrace and Walters Terrace. Local east-west connectivity is provided by Evergreen Terrace, West Virginia Drive, and Walters Terrace.

Currently, the primary routes of interconnectivity across the NFSLR within the study area for pedestrians, transit riders, and non-vehicular traffic are Port St. Lucie Boulevard and Prima Vista Boulevard. Multi-lane roads with high traffic volumes can be perceived as an obstruction to mobility for pedestrians, non-vehicular traffic, and intermodal users. However, all provide signalized crosswalks, which provide a means of maintaining access across these barriers.

Currently, a limited mass transit service is available within the City. Community Transit, a division of the Council on Aging of St. Lucie, Inc. (COASL), provides public transit for St. Lucie County. COASL is a non-profit organization that provides transit services to seniors and other transit-disadvantaged individuals. Community Transit provides three fixed bus routes (Treasure Coast Connector) which serve the study area and a demand-based service with prearranged appointments (Community Transit). The Treasure Coast Connector Route 1 passes through the study area on U.S. 1 between Avenue D in Fort Pierce and the Treasure Coast Mall in Jensen Beach. Treasure Coast Connector Route 6 is a route along Prima Vista Boulevard with a loop around the roadways of Airoso Boulevard, Crosstown Parkway and Floresta Drive. In addition, the City is serviced by the Port St. Lucie Downtown Trolley. Part of its route travels along Veterans Memorial Parkway from south of Port St. Lucie Boulevard to Walton Road. The hours of operations for all transit services are on weekdays between 7:00 AM and 6:00 PM.



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Neighborhood Connectivity

Figure No. 4.4

4.1.1.5 Special Needs Patrons

The City was originally designed and developed as a retirement community. Although some areas of the City can be characterized as retirement developments (e.g., La Buona Vita), census data indicate that all age classes, including family groups, are distributed throughout the project area. However, census data show that the project area (and City) currently contains a relatively high percentage of persons older than 65 years who currently or may in the near future need assistance accessing community services, businesses, and other community facilities within the study area.

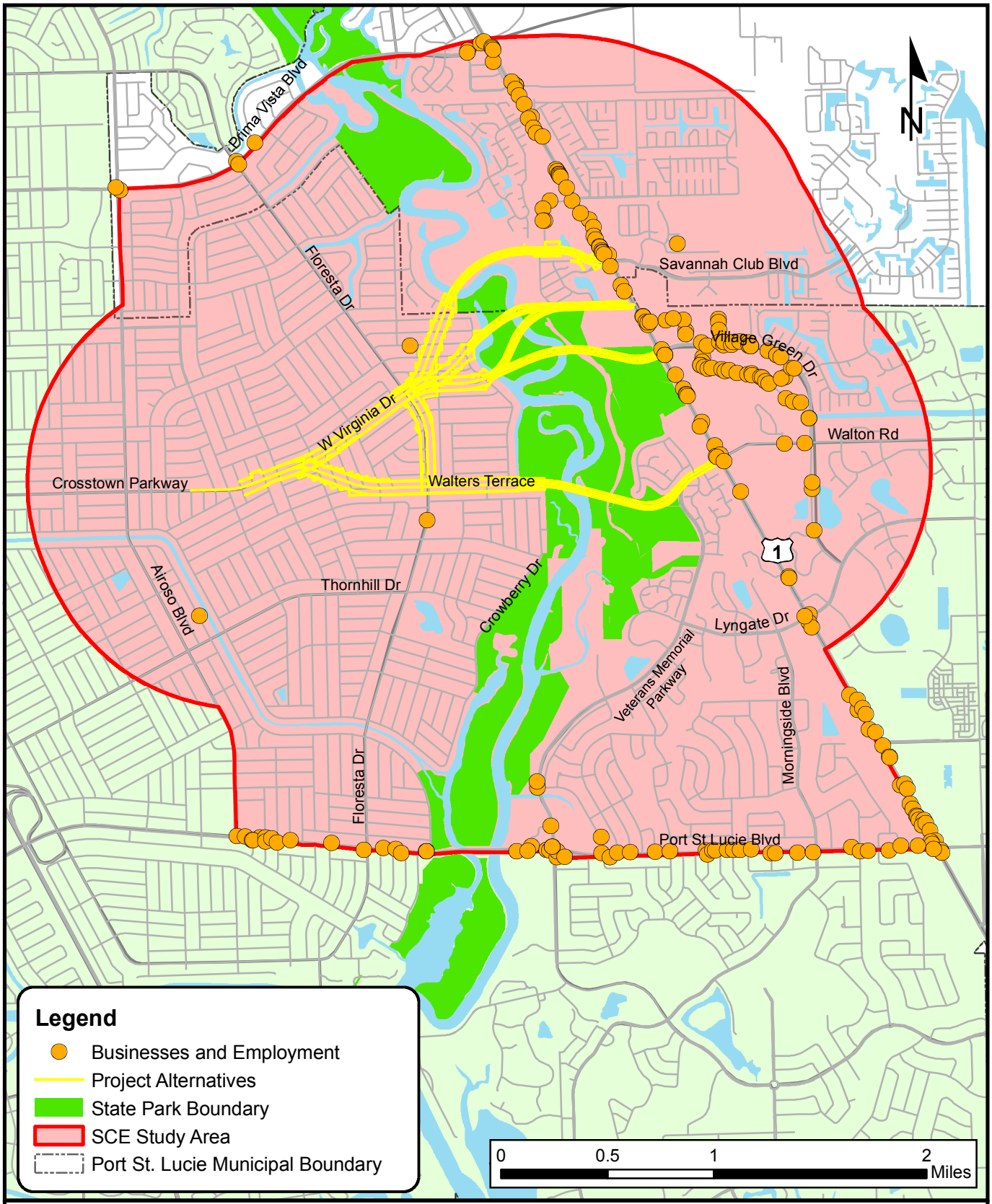
The percentage of the population in each census tract that is 65+ years old was compared to the 20 percent County-wide average population that is 65+ years old. Census Tract 20.01 has a 65+ population of 29.5 percent which exceeds the County-wide average. Census Tracts 20.02 and 20.03 have 65+ populations of 14.7 and 16.0 percent, respectively, which are under the County-wide average. All three census tracts have persons categorized as disabled. The County-wide average for disabled individuals is 14.0 percent. Census Tract 20.01 has a disabled population of 29.2 percent, while Census Tracts 20.02 and 20.03 have disabled populations of 29.9 and 22.4 percent, respectively. Each tract is over the County-wide average.

To obtain further information regarding the potential for impacts to disadvantaged populations, COASL was consulted to ascertain the location of any transit dependant groups, such as the elderly or handicapped. COASL is a non-profit organization that provides services to seniors of St. Lucie County. COASL confirmed that La Buona Vita is a community where residents are required to be 55 years old or older. It was also noted by Community Transit that the Savanna Club Adult Community, located on the east side of U.S. 1 across from La Buona Vita, is also a community where residents must be 55 years of age or older. However, the Savanna Club Adult Community is situated just outside the eastern study limit (U.S. 1). Community Transit staff said that its door-to-door transit service handles 150 Americans with Disabilities Act (ADA) patrons within the project area. The elderly population within La Buona Vita is included in that number, with the remaining ADA patrons scattered throughout the project area. Within the project area, Community Transit's fixed bus routes include a bus stop on U.S. 1 at La Buona Vita Drive. This bus stop serves the elderly community of La Buona Vita.

4.1.2 Economic Evaluation

4.1.2.1 Businesses and Employment

Economic conditions and employment describe a community's economic history, current economic well-being, and future potential. This information takes into account employment levels, types of jobs, per capita income, poverty rates, unemployment rates, the range of incomes in the community, and trends in employment opportunities (e.g., family-owned businesses versus national chain businesses). Although the project area is predominantly residential, many businesses are located along U.S. 1 and other major roadways. These businesses are important community resources, contribute to the quality of life, and provide employment opportunities. **Figure 4.5** shows the distribution of these businesses. Currently, the primary routes for employees and patrons to access businesses on U.S. 1 are Port St. Lucie Boulevard and Prima Vista Boulevard. St. Lucie County also has major employment centers, such as St. Lucie County



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Businesses and Employment
Figure 4.5

School Board, Wal-Mart Distribution Center, St. Lucie County, Liberty Medical Center, City of Port St. Lucie, QVC, Indian River Community College, and Publix Super Markets.[2] Although none of these employers would be negatively impacted as a result of the project, the City' Engineering Division met with the governmental employers to advise them of the potential changes in access and mobility as a result of the project [Cul-de-Sac Meeting held on April 28, 2009 (**Appendix I**)]. These employers included the City of Port St. Lucie Police and Fire Departments and the St. Lucie County School Board. It was important to obtain input from these public agencies due to their roles in public safety. During this meeting, the School Board representative noted that Alternative 1C (Preferred Alternative) would be good from a pedestrian standpoint and would provide minimal impact to the students walking to and from Floresta Elementary School. The Fire Department and Police Department noted that Alternative 1C (Preferred Alternative) would be helpful in speeding up emergency responses and would allow for more access. This coordination is also summarized in Section 5.1.1.1.3.1 (Regional /Emergency Response). The study area is relatively small compared to the rest of the County and the region so that economic conditions are typically determined by external regional and national factors such as the economic downturn beginning in 2008.

4.1.2.2 Tax Base

The effect of a project on the tax base of a community may range from negligible to significant. When considering effects on the tax base, many variables are reviewed, including property values, the millage rate of a community, total ad valorem revenue collected by the community, the percentage of the budget of the community that is funded by ad valorem revenue, the percentage of the total ad valorem revenue collected in the study area, and the effect of the project on property values in the study area.

The SCE study area contains a small portion of the jurisdiction-wide tax base, especially along the major roads that define its boundaries. The total tax base in the City for 2008 was $287,490,799 and the total tax base in the County was $495,621,567. These totals were obtained from the St. Lucie County Tax Collector by totaling the Total Tax fields in the County and City databases, respectively. Due to the economic downturn, the 2011 tax base in the City of Port St. Lucie dropped to $232,341,850 and the 2011 tax base in St. Lucie County dropped to 391,696,110. This equates to a drop in tax base of approximately 19.2 percent and 21.0 percent, respectively since 2008.

Historic neighborhoods and business districts, particularly those designated as local historic districts or officially listed on the *National Register of Historic Places*, represent important economic assets to a community. Consequently, the loss of individual historic resources and districts may negatively impact property values and should be considered as part of the SCE Evaluation. No such historic resources or districts occur in the SCE study area.

Additional considerations include the land use classification affected by the project. Traditionally, property classified as industrial, commercial, or higher density residential has the highest property values. If a community has limited amounts of land in these classifications and large amounts of rural and low density residential land, then projects affecting the industrial, commercial, and high density land can have more

[2] Economic Development Council of St. Lucie County (http://www.youredc.com/html/economic_research_info.asp); accessed 12/30/2011.

significant effects on the tax base. Within the SCE study area, properties classified as industrial, commercial, and higher density residential are located along the major roadways throughout the City, including U.S. 1 (**Figure 4.5**).

4.1.2.3 Residential Property Values

There are often concerns that construction of a major roadway through a residential community will adversely affect residential property values. To quantitatively address these concerns, an analysis was performed for the SCE study area of residential property values along existing major roadways, comparing the values of properties along the roadway to the values of property that are one and two lots away from the roadway. The roadways selected were Prima Vista Boulevard, which also has a bridge crossing of the NFSLR; Airoso Boulevard; and the Crosstown Parkway which had recently been completed in March 2009.

Overall, the results of the analyses indicate that no substantial difference exists between the values of residential properties immediately adjacent to the roadways and the values of residential properties located one or two lots away from the roadway. In the case of the existing Crosstown Parkway section, there appears to have been a small increase in the value of properties on West Virginia Drive during the time that they were being acquired to construct the existing section. No substantial change is evident in the properties that were not acquired. However, the analysis reflects the dramatic rise and fall in property values over recent years. This matches national and state trends associated with the downturn of the real estate market that began in 2008.

4.1.3 Railroads and Utilities

4.1.3.1 Existing Railroads

There are no railroads located within the project area. The Florida East Coast (FEC) Railway is located parallel to and west of River Drive, approximately 3 miles east of U.S. 1. The nearest FEC terminal is located in Fort Pierce.

4.1.3.2 Existing Utilities

Numerous existing utilities are present within the project area, either as buried or above-ground utilities. Their types and locations are summarized in this section. Details and mapping regarding the various utilities can be found in the *Utility Assessment Package*.

4.1.3.2.1 Existing Utilities West of the NFSLR

Florida Power & Light (FPL) main overhead lines run along the right of way line of the West Virginia Drive corridor from Manth Lane to Floresta Drive, along Floresta Drive from north of West Virginia Drive to south of Walters Terrace, and along Walters Terrace from west of Floresta Drive to Coral Reef Street. Overhead and buried lateral lines branch off of the main pole line and supply electricity directly to homes. No substations are located within the project area. AT&T provides service using a system of buried telephone lines which generally follow the same path as the FPL overhead electric lines. Comcast has existing

overhead cable television lines along the northern and southern right of way line of the West Virginia Drive corridor from Manth Lane to Floresta Drive. FPL/Comcast pole lines in this section are located in easements between existing residences. At Floresta Drive, the overhead cable television lines share the pole line with FPL and continue north of West Virginia Drive and south to Walters Terrace. The overhead cable television lines continue to share the same pole line as FPL and extend west from Floresta Drive to Coral Reef Street. Buried water mains and sanitary sewer lines exist along West Virginia Drive corridor from Manth Lane to Floresta Drive, along Floresta Drive from north of West Virginia Drive to south of Walters Terrace, and along Walters Terrace from west of Floresta Drive to Coral Reef Street.

4.1.3.2.2 Existing Utilities East of the NFSLR

FPL overhead distribution lines exist on both sides of U.S. 1 from south of the intersection of Veterans Memorial Parkway to north of the intersection of Savanna Club Boulevard. FPL also owns a large overhead transmission line on the west side of the U.S. 1 corridor within these limits. Overhead electric lines are also located along the median of Veterans Memorial Parkway. The FPL Savannah Substation is located on U.S. 1 just north of Veterans Memorial Parkway. AT&T has existing buried facilities running along the U.S. 1 corridor from south of the intersection of Veterans Memorial Parkway to north of Savanna Club Boulevard. Comcast has existing overhead cable television lines running along the median of Veterans Memorial Parkway. Overhead cable television lines also exist along U.S. 1 from south of the intersection of Veterans Memorial Parkway to north of Savanna Club Boulevard. Buried water mains exist along the west right of way line and sanitary sewer lines exist along the east right of way line of U.S. 1 from south of the intersection of Veterans Memorial Parkway to north of Savanna Club Boulevard. Buried water mains and sanitary sewer lines are also located along Veterans Memorial Parkway. Buried Florida City gas lines are located along the east side of U.S. 1 from south of the intersection of Veterans Memorial Parkway to north of Savanna Club Boulevard.

4.2 Cultural and Historic Resources

4.2.1 Archaeological and Historical

A *Cultural Resource Assessment Survey (CRAS) Report* was prepared for the proposed project. The survey was a comprehensive review that examined the archaeological and historical literature, records, and other documents and data pertaining to the project area. The CRAS was conducted in compliance with Section 106 of the *National Historic Preservation Act of 1966* (Public Law 89-655, as amended), as implemented by 36 CFR 800 (*Protection of Historic Properties*, revised August 5, 2004); NEPA; and Chapter 267 Florida Statutes (FS). All work was carried out in conformance with Part 2, Chapter 12 of the *PD&E Manual* and the standards contained in the Florida Division of Historical Resources' (FDHR) *Cultural Resource Management Standards and Operations Manual* (FDHR 2003). In addition, this report meets the completeness and sufficiency requirements of Chapter 1A-46 Florida Administrative Code (FAC). The focus of the research was to ascertain the types of cultural resources known in the project area and vicinity, their temporal/cultural affiliations, site location information, and other relevant data. This included a review of sites listed in the National Register of Historic Places (National Register), the Florida Master Site File (FMSF), cultural resource survey reports, published books and articles, unpublished manuscripts, and

historic maps. An archaeological and cultural field survey of the Area of Potential Effects (APE)[3] was conducted for each of the six build alternatives, the adjacent properties, and associated stormwater pond locations. The field survey was coordinated with the State Historic Preservation Officer (SHPO). The detailed results can be found in the technical support document titled, *Cultural Resource Assessment Survey (CRAS) Report*.

4.2.1.1 Area of Potential Effects (APE)

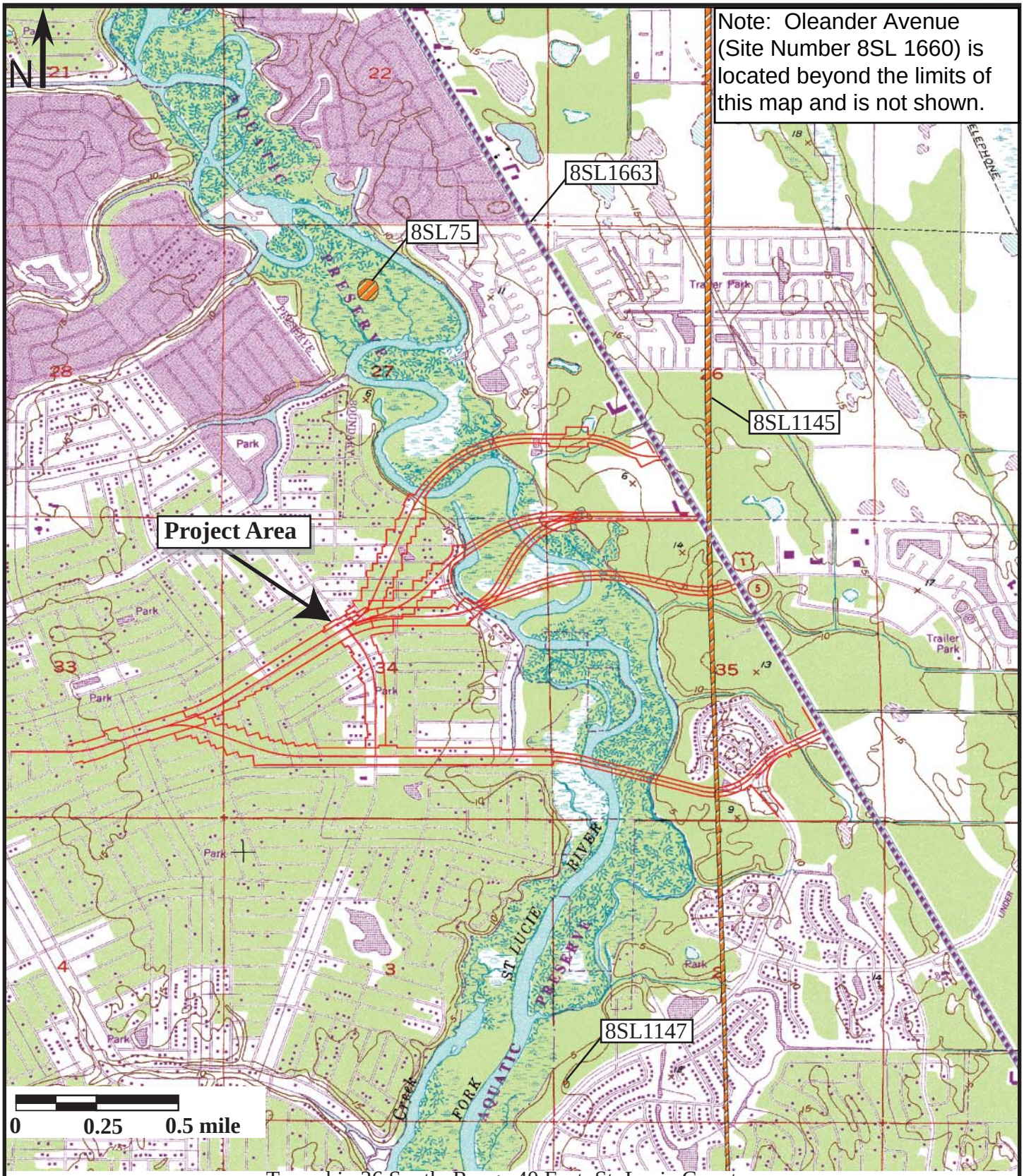
The APE for the archaeological survey included the right of way contained within each of the six build alternatives (**Figure 4.6**). The APE for the historical/archaeological field survey also included the properties adjacent to the right of way for each of the alternatives. Environmental factors such as geology, topography, relative elevation, soils, vegetation, and water resources are important in determining where prehistoric and historic period archaeological sites are likely to be located. The project area is located within the Glades region, which begins along the west coast in the Ten Thousand Islands. The Glades region includes the Florida Keys and extends up the east coast of Florida to Indian River County. This is an environmentally diverse region, in which the many freshwater wetlands, including the Everglades and Big Cypress Swamps and the saltwater marshes and mangrove forests along the coasts, were key to the subsistence strategies of the aboriginal inhabitants. The spatial boundaries of the region are somewhat arbitrary, and after 500 B.C., regional differences become more evident in the archaeological record.

Physiographically, the project is located within a flat, relict beach plain with elevations 15 to 30 feet above mean sea level. Prior to development, the area was characteristically pocketed with shallow lakes and marshes with poor natural drainage. Prior to the construction of canals to the north and south of the APE in the early and mid 1900s, the region naturally drained by a slow flow through multiple sloughs to the St. Lucie and Loxahatchee Rivers and the Everglades. Between the 1920s and 1940s, the NFSLR was modified by dredging and straightening sections of the River for navigation purposes. This resulted in the creation of spoil piles along the river banks. Many oxbows were isolated and berms were created that disrupted the natural water flow. While most of the large-scale dredging occurred to the north and south of the APE, the project area has experienced significant changes due to development.

4.2.1.2 Archaeological Resources

The Paleo-Indian, Archaic, Formative, and Acculturative stages in the project area were considered based on unique sets of material culture traits, such as characteristic stone tool forms and ceramics, as well as subsistence, settlement, and burial patterns. The earliest known cultural manifestation is the Paleo-Indian period, which began with the first human arrivals in Florida some 14,000 years ago, and persisted until about 6500 B.C. The relatively recent history of the region was divided into four broad periods based on the major governmental powers at the time (Colonialism, Territorial and Statehood, Civil War and Aftermath, and Twentieth Century). Each of these periods evidenced differential development and utilization of the region, thus affecting the historic site distribution across the land. The details of this history can be found in the CRAS Report.

[3] The APE is the geographic area within which the character or use of historic properties may be changed as a result of a proposed project.



Township 36 South, Range 40 East, St. Lucie County
(GIS USGS Ankona 1983)

FM No. 410844-1-28-01
FP No. 7777-087-A
ETDM No. 8247

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Location of Previously Recorded Archaeological Sites Proximate to APE

Figure 4.6

A review of the FMSF data indicated that no previously recorded archaeological sites are recorded within the archaeological APE. A total of 24 professional surveys have been conducted within 2 miles of the APE, of which 19 yielded negative results. Additionally, a monitoring project carried out by Savannas Preserve State Park personnel yielded negative results. Five of the 24 surveys yielded positive results. Two previously recorded prehistoric sites (8SL75 and 8SL1147) and three historic roads have been identified within a 2-mile radius of the APE, as shown in **Table 4.2** and **Figure 4.6** (the Oleander Avenue Site is beyond the range of **Figure 4.6** and is not shown). One of these roads, U.S. 1, is located adjacent to the project APE. This historic roadway was considered ineligible for listing on the National Register during a County-wide historic resources survey in 2003. It was found that development and road improvement had significantly altered the historic physical integrity of large portions of the roadway throughout the County. In 2007, SHPO agreed with the assessment and determined that a segment of U.S. 1, north of the APE, was not eligible for National Register listing. The four locations where the project APE abuts the roadway have also experienced significant development and road improvements and the portion of U.S. 1 within the project area also lacks the historic physical integrity necessary for National Register listing.

Table 4.2 Sites Recorded within Two Miles of the Project Area

Site Number	Site Name	Site Type	SHPO Evaluation
8SL75	Calmoso Drive	Prehistoric shell scatter/midden	Not evaluated
8SL1145	Old Road	Historic road	Not evaluated
8SL1147	Walden Woods	Prehistoric campsite	Ineligible
8SL1660	Oleander Avenue	Historic road	Ineligible
8SL1663	U.S. 1	Historic road	Ineligible

Previous archaeological surveys include portions of land within and immediately adjacent to the project area APE. These include an assessment of several upland parcels along the NFSLR, an assessment survey of U.S. 1 from Port St. Lucie Boulevard to Rio Mar Drive, and a survey of the Bella Vista Commercial project area. Of five documented archaeological sites located within two miles of the project area (**Table 4.2**), one (8SL75) was documented as the result of Phase II testing during a 1988 survey of the St. Lucie River Aquatic Preserve, one (8SL1145) was recorded as the result of a survey of the uplands adjacent to NFSLR, one (8SL1147) was the result of a survey of private property to the south of the project, and two (8SL1660 and 8SL1663) were documented and evaluated as a result of a St. Lucie County historic survey but were judged National Register ineligible by the SHPO as a result of highway survey projects north of the project APE. No sites have been documented on or immediately adjacent to the river banks.

An archaeological field survey was conducted, which included informant interviews, visual reconnaissance, ground surface inspection, and the excavation of 126 shovel tests within the archaeological APE. In May 2012, following the selection of the Preferred Alternative, an archaeological and historical/architectural field survey was conducted of six stormwater pond sites associated with the Preferred Alternative. No archaeological sites were identified within the six stormwater pond sites and no historic resources were identified within or adjacent to any of the six sites. The details of the subsurface investigation can be found in the CRAS Report.

4.2.1.3 Historic/Architectural Resources

A review of the FMSF revealed that no historic resources have been recorded previously within the historical APE. A historic resources survey was conducted in 2003 for the unincorporated areas of the County and while this survey did not include the City, the area adjacent to and east of the NFSLR within the APE was included. No resources were identified within the project APE as a result of the survey. The City was not incorporated until 1961; the population in 1970 was 330, and the majority of the growth has occurred since the 1980s, which indicates that the potential for historic structures is low. Additionally, inspections of historic aerial photographs (1958a, 1958b, 1958c, 1958d) and the U.S. Geological Survey map (USGS, Ankona quadrangle, 1948) did not indicate the presence of any structures 50 years of age or older within the historical APE, including docks and landings. Based upon the results of background research and confirmed by field surveys, no architectural or historic resources were discovered that were listed, determined eligible or considered potentially eligible for listing in the National Register.

4.2.1.4 Concurrency with Archaeological and Historic/Architectural Resources

Based on the findings of the CRAS, FHWA made a determination that the six build alternatives would not impact any historic or archaeological resources listed or eligible for listing on the National Register of Historic Places (National Register).[4] The State Historic Preservation Officer (SHPO) concurred with the recommendations and findings of the CRAS.[5] Following the selection of the Preferred Alternative, an addendum to the CRAS was prepared to address the stormwater pond sites for the Preferred Alternative. Based on the findings of the addendum to the CRAS, FHWA determined that the stormwater pond sites associated with the Preferred Alternative will not impact any historic or archaeological resources listed or eligible for listing on the National Register.[6] SHPO concurred with the findings of the CRAS addendum.[7]

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[4] Letter from FHWA, dated April 19, 2010 (**Appendix A**).
[5] Letter from SHPO, dated May 20, 2010 (**Appendix A)**.
[6] Letter from FHWA, dated August 21, 2012 (**Appendix A**).
[7] Letter from SHPO, dated September 4, 2012 (**Appendix A**).

4.2.2 Recreation and Parkland

A number of public parks and other recreation areas (**Table 4.3**) are located within the project area (and the SCE study area; **Figure 4.2**). The NFSLR Aquatic Preserve, Savannas Preserve State Park, and Kiwanis Park (a neighborhood park) are located within the project area. All three properties have been designated Section 4(f) resources and are discussed in Section 6.0 (Section 4(f) Evaluation).

Table 4.3 Public Parks and Recreation Areas

Name	Address
Doat Park	425 SE Doat Street
Harborview Park	624 SE Harborview Drive
Kiwanis Park	1320 SE Floresta Drive
Lyngate Park	1301 SE Lyngate Drive
Midport Lake	1800 SE Veterans Memorial Parkway
North Fork St. Lucie River Aquatic Preserve	3300 Lewis Street, Fort Pierce
Ravenswood Center and Offices	400 SW Ravenswood Lane
Rotary Park	2101 SE Tiffany Avenue
Savannas Preserve State Park	9551 Gumbo Limbo Lane, Jensen Beach
Sportsmans Park	201 NW Prima Vista Boulevard
Sportsmans Park West	220 NW Irving Street
St. Lucie County River Park Marina	500 SE Prima Vista Boulevard
Tom Hooper Park	2340 SE Rivergate Parkway
Veterans Memorial Park	2100 SE Veterans Memorial Parkway
Veteran's Park at Rivergate	2200 SE Veterans Memorial Parkway
Whitmore Park	474 SE Whitmore Drive
Woodstork Trail	1957 SE Hillmoor Drive

4.3 Natural and Physical Resources

4.3.1 Pedestrian and Bicycle Facilities

Under Title 23 United States Code (USC), Section 109(n), projects cannot be approved if "they result in the severance of an existing major route or have significant adverse impact on the safety for non-motorized transportation traffic and light motorcycles, unless such project or regulatory action provides for a reasonable alternate route or such a route exists." Florida statutes also provide for the consideration of non-motorized facilities in the planning and development of transportation projects, especially in urban areas (Title 26, Section 335.065 FS).

Existing bicycle facilities and pedestrian sidewalks within the project area are currently discontinuous. The existing Crosstown Parkway that extends from I-95 to Manth Lane has a designated 5-foot bicycle lane in both directions and 8-foot sidewalks (part of a landscaped green space with a shared-use pathway design) on both sides of the parkway. Floresta Drive has 6-foot sidewalks on the east side of the road for approximately 500 feet north of Thornhill Drive and on both sides of the road between Damask Avenue and Walters Terrace (in front of Floresta Elementary School). The existing Port St. Lucie Boulevard bridge has sidewalks on both sides of the bridge, while there is sidewalk only along the south side of the Prima Vista Boulevard bridge. Veterans Memorial Parkway has an 8-foot sidewalk on the west side and a 4-foot undesignated bicycle lane outside of the travel lanes in each direction. Savanna Club Boulevard has a 5-foot sidewalk and 6-foot undesignated bicycle lane on both sides of the road. U.S. 1 has 6-foot sidewalks in both directions within the entire study area, separated from the roadway by varying distances of maintained right of way. Designated bicycle lanes are not provided, although the sidewalks can also be used by bicyclists. Other local roads in the project area do not have bicycle lanes or sidewalks. Besides the Crosstown Parkway, designated bicycle facilities are not provided so bicyclists must use the existing traffic lanes, shoulders, or sidewalks (where they exist) to continue their journey.

Physical barriers to the interconnectivity between or within communities can be natural or man-made obstructions. Within the project area, the NFSLR is a natural obstruction to the interconnectivity between communities on either side of the River. Currently, connectivity for pedestrians and all other modes of land transportation between both sides of the NFSLR are Port St. Lucie Boulevard and Prima Vista Boulevard. No designated bikeways or paved shoulders currently exist along either Port St. Lucie Boulevard or Prima Vista Boulevard, and sidewalks are currently provided as discussed above. Major man-made obstructions to the interconnectivity between or within communities are the major traffic connectors of Port St. Lucie Boulevard, U.S. 1, and Prima Vista Boulevard. However, all provide signalized cross walks for pedestrians and bicyclists.

4.3.2 Visual and Aesthetic

Title 23 USC 109(h) and Technical Advisory T 6640.8A are the regulations and guidance that implement the NEPA requirements regarding the aesthetic effect of a proposed project on the human environment. State legislation also requires the consideration of aesthetics in the development of all highway projects [Sections 334.044 FS, 336.045 (1) FS, 336.045 (6) FS, and 339.155 (2)(k) FS]. Through the ETDM Programming Screen, the St. Lucie County Transportation Organization identified aesthetics as an issue that could require public involvement efforts to determine aesthetic enhancements that the community may desire.

Opinions regarding aesthetic qualities are highly subjective and vary within the community. However, resources that are generally considered to contribute to the aesthetic quality of a community include street trees, scenic views, parks, green spaces, water features, historic structures, local landmarks, and cultural resources. On the other hand, some features can elicit negative reactions, such as abandoned buildings, deteriorating structures, or elements of urban decay. The placement and design of a transportation facility can diminish the aesthetic character of the surrounding area due to contrasts between natural landforms or existing structures. Engineered roadway elements, blocked views, or a scale that is out of proportion to the surrounding landscape elements are other factors that can interfere with the aesthetic character of an area.

However, a transportation facility can enhance the visual environment by a careful and thoughtful placement of the facility within the existing environment.

Visual elements that are relevant and considered in this section are the views from the existing roadway system and views of the natural river environment. Visual impacts are evaluated by defining the visual environment, identifying key views, analyzing the resources and community responses, depicting the project appearance, assessing visual impacts, and then identifying potential mitigation measures, if required.

4.3.2.1 Existing Roadway Views

Existing land uses in the study area on the west side of the NFSLR are predominately single-family residential. With the exception of an area along Floresta Drive just south of Walters Terrace that includes an elementary school and churches, the area affected by the proposed improvements consists of improved and unimproved residential lots. These properties are generally 10,000 square foot lots, approximately 75 to 85 percent improved with single-family homes.

Photo 4.2. View of existing Crosstown Parkway, showing landscaped green space with shared-use pathway.

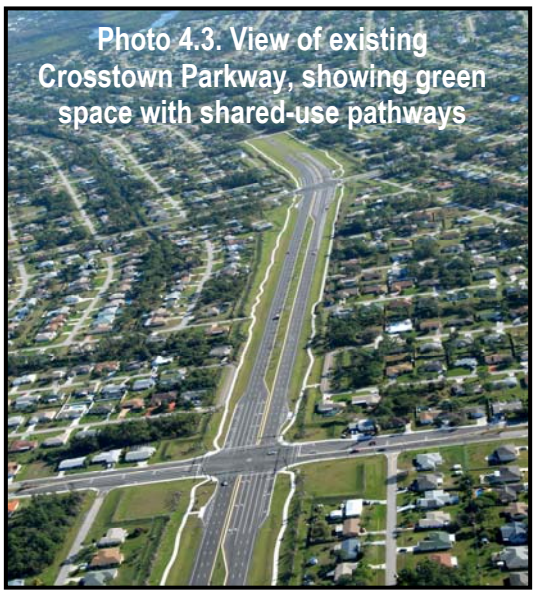


Photo 4.3. View of existing Crosstown Parkway, showing green space with shared-use pathways

Due to the essentially flat topography, views are limited and consist of the immediate area of 2-lane streets with grassy swales and of landscaped residential lots (as opposed to a vista that can extend for a distance). Some vacant lots are also present and are dominated by native and non-native forested features [Section 4.3.14 (Wildlife and Habitat)]. Exceptions to the 2-lane residential cross section are the views along the existing Crosstown Parkway that extends from I-95 to Manth Lane. Views from and of this road are of a 6-lane parkway (**Photo 4.2**) with landscaped green space with a shared-use pathway on both sides of the roadway and landscaped berms; residences are in the background (**Photo 4.3**). At Manth Lane, the Crosstown Parkway ends and the 2-lane residential cross section resumes. East of the NFSLR, the views from U.S. 1 are of a mixed-use corridor. The views are of single-family residential units, multi-family residential units (including duplexes and condominiums), and limited public/institutional facilities. Along U.S. 1, the existing land uses are mostly strip developments comprised of commercial and office uses. Some views of the Savannas Preserve State Park can be seen on the western side of U.S. 1, south of Village Green Drive. Some residential areas are located along Veterans Memorial Parkway. Views from these areas are of 2-lane residential streets, similar to those of the residential streets west of the NFSLR.

4.3.2.2 Existing NFSLR Views

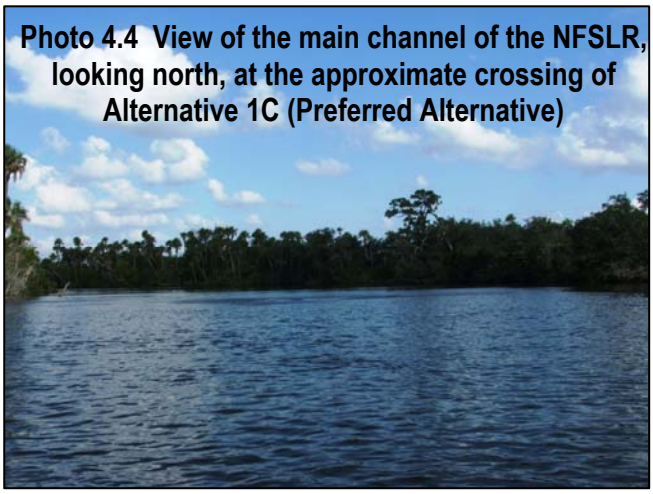


Photo 4.4 View of the main channel of the NFSLR, looking north, at the approximate crossing of Alternative 1C (Preferred Alternative)

The views by users of the NFSLR and its tributaries are currently of a generally undeveloped river bordered by native and non-native vegetation (**Photo 4.4**). Some shoreline residences are visible along the North and South Coral Reef Waterway (Coral Reef Street) and along the main channel along Hidden River Drive. The main channel is approximately 200 to 500 feet wide, while Evans Creek varies from a few feet to approximately 100 to 200 feet wide. In general, views from the NFSLR are currently of mangrove or live oak/cabbage palm communities. Details of the natural communities within the river floodplain are described in Sections 4.3.5 (Wetlands), 4.3.14 (Wildlife and Habitat), and 4.3.15 (Essential Fish Habitat).

4.3.3 Air Quality

The Clean Air Act (CAA) and its amendments contain strategies to reduce air pollution and pollutant precursor emissions from mobile sources and to provide sanctions for not achieving and maintaining the National Ambient Air Quality Standards (NAAQS). The project is located in an area that has been designated as an Attainment Area for all NAAQS under the criteria provided in the CAA. The project was evaluated for potential emissions that could be caused by sources that contribute to the overall air quality conditions existing in St. Lucie County (Existing Conditions). The details of the air quality information are provided in the technical support document titled, *Air Quality Report*. The analysis was performed in accordance with Part 2, Chapter 16 of the *PD&E Manual*.

The CO Florida 2012 screening model was used to perform carbon monoxide (CO) screening tests at project intersections. A CO screening analysis was performed for all proposed signalized intersections along the proposed Crosstown Parkway Extension from Manth Lane to U.S. 1. Signalized intersections are typically the locations with the highest CO concentrations generated by traffic. CO emissions increase with traffic volumes and are higher for older vehicles. Pollutant emissions were obtained from the CORSIM traffic microsimulation software. A worst-case condition was developed for each intersection by performing the CO screening tests for opening year in 2017 and the design year in 2037 and by assuming, for each approach of the intersection, the highest traffic volume of all design alternatives. While these peak volumes on all approaches will likely not materialize, they represent worst-case conditions for CO emissions.

In addition to the CO screening analysis, the project was assessed for greenhouse gasses (GHG) and Mobile Source Air Toxics (MSATs). The issue of global climate change is an important national and global concern that is being addressed in several ways by the federal and state governments. The transportation sector is the second largest source of total greenhouse gases (GHG) in the United States and is the greatest source of carbon dioxide (CO_2) emissions which is the predominant GHG.

MSATs are regulated by the USEPA and include compounds emitted from highway vehicles and non-road equipment. MSATs are a subset of 188 toxics defined in the Clean Air Act. Seven of those 188 toxics have currently been identified as priority MSATs. These include acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter.

The results of the CO screening tests, along with an assessment of the project's effect on GHG and MSATs, are provided in the *Air Quality Report* and in Section 5.3.3 (Air Quality) of the EIS.

4.3.4 Noise

A noise analysis was conducted for the project in accordance with FHWA rules and the FDOT Noise Policy. These guidelines are contained in the FDOT Noise Policy (Part 2, Chapter 17 of the *PD&E Manual)*. Section 335.17 FS requires the use of 23 CFR Part 772 in the noise impact assessment process, regardless of funding, and the implementation of these rules is contained in Part 2, Chapter 17 of the *PD&E Manual*.

The first step in conducting a noise analysis is to assess existing conditions, including the identification of noise sensitive sites. Noise sensitive receptors are defined as any property (owner occupied, rented, or leased) where frequent "exterior human use" occurs and where a lowered noise level would be of benefit. Land uses west of the NFSLR are predominately single-family residential homes. Land uses on the east side of the NFSLR consist of single-family units and several multi-family buildings, with commercial buildings along U.S. 1. Within the project area, there are five multi-family buildings for a total of 20 residential units. Two multi-family buildings are single-story structures; the other three have single-story levels for the end units and two stories in the middle. The 2-story apartments have no balconies or large windows facing the road from the second floor and so all unit receptors for the model were placed five feet above first floor level. Consistent with the guidance provided in the *PD&E Manual*, unless the area of exterior frequent use is identified elsewhere, residential receptor sites were placed at the edge of the dwelling unit closest to the major traffic noise source, as dictated by professional judgment. First floor and second floor receptors were assumed to be placed five feet and 15 feet above ground, respectively. Consistent with these guidelines, 1-level residential receptors were placed at the edge of the dwelling unit closest to the major traffic noise source at a height of five feet. The analysis was performed for all noise sensitive sites potentially impacted by the proposed project.

Noise levels were measured to establish existing ambient noise levels along the current roadway network and to verify that traffic noise is the primary source of noise in the study area. These measurements allow for the validation of the noise model under existing conditions. Field noise was measured using an integrated sound meter at six locations east and west of the River to establish ambient noise levels at each of these locations (**Figure 4.7**). Three 10-minute measurements were conducted at each location in accordance with FHWA's guidance document "Measurement of Highway-Related Noise." The field measurement averages representing existing ambient noise levels are shown in **Table 4.4**. A seventh site was used to validate the TNM noise model (Site #7) and is discussed in Section 5.3.4 (Noise). Details of the noise analysis performed can be found in the Noise Study report available from the FDOT District Office at 3400 West Commercial Boulevard, Fort Lauderdale, FL 33309.

Table 4.4 Existing Ambient Noise Levels

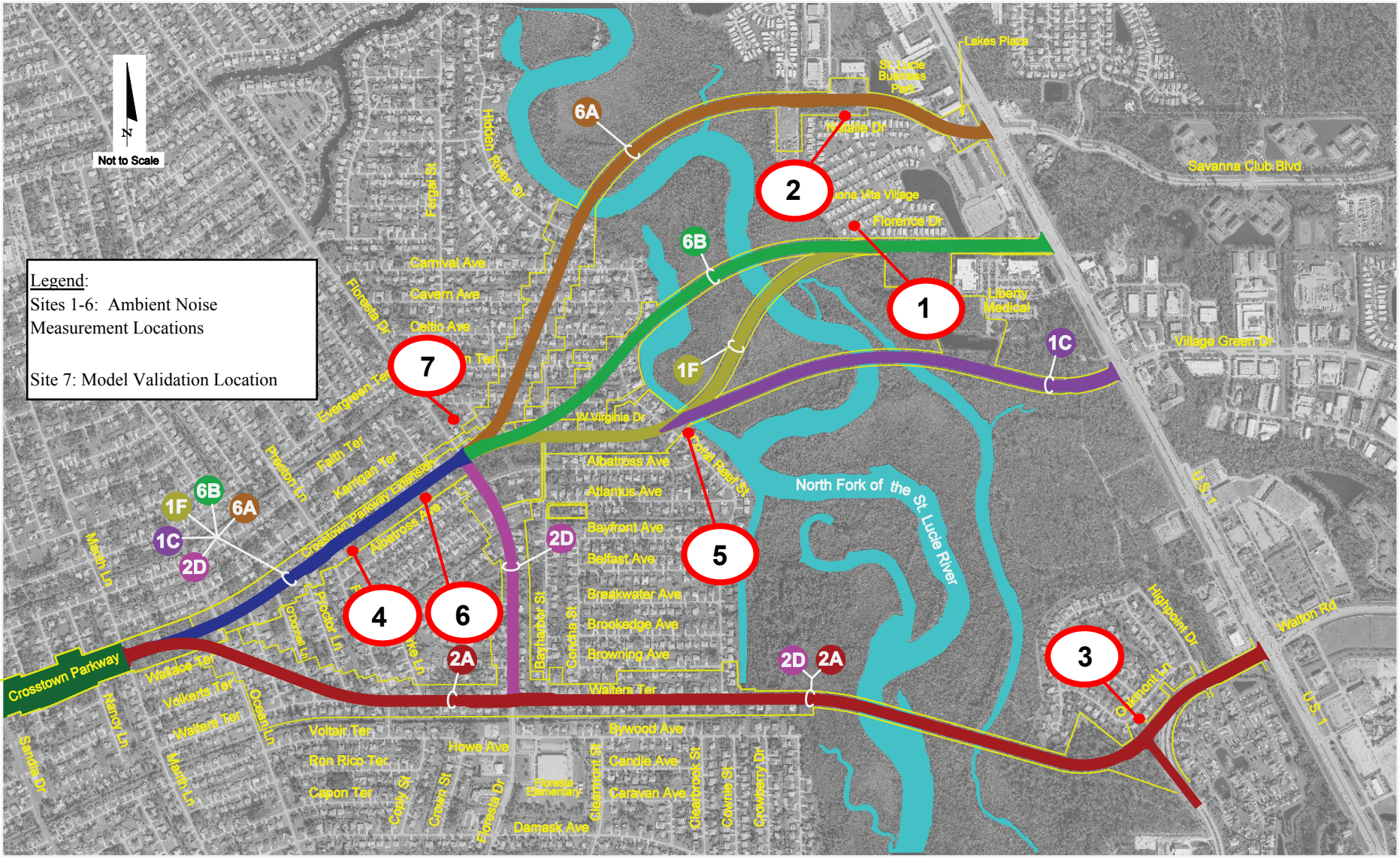
Noise Measurement Location	Run1 Leq (dBA)	Run 2 Leq (dBA)	Run 3 Leq (dBA)	Average Noise Level (dBA)
1	44.0	39.2	44.7	42.6
2	51.8	47.8	46.4	48.7
3	54.9	55.0	53.9	54.6
4	49.0	49.2	52.0	50.1
5	44.3	51.8	47.0	47.7
6	50.3	50.3	50.8	50.5

4.3.5 Wetlands

The primary federal jurisdiction over wetlands is derived from Section 404 of the Clean Water Act (CWA), 1972, as amended in 1979. Section 401 of the CWA also established a state regulatory authority over wetlands as they relate to water quality effects of a proposed project. Other federal jurisdictional authority over wetlands is derived from a number of sources: Presidential EO 11990 (dated May 23, 1977), USDOT Order 5660.1A (dated August 24, 1978), and FHWA Technical Advisory T6640.8A (dated October 30, 1987). EO 11990 entitled "Protection of Wetlands" established a national policy to "avoid to the extent possible the long-term and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative." USDOT Order 5660.1A entitled "Preservation of the Nation's Wetlands," implements EO 11990. The FHWA has implemented its wetland policy through Technical Advisory T6640.8A, which provides guidance on the preparation of environmental documents, including the assessment of project impacts on wetlands.

The U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), South Florida Water Management District (SFWMD), and Florida Department of Environmental Protection (FDEP) have identified the forested and emergent wetlands associated with or near to the NFSLR as high quality wetlands. The wetlands were identified as having valuable aquatic functions and values, including habitat for listed plant and animal species. All agencies identified these wetlands (and submerged lands) as part of the NFSLR Aquatic Preserve and Savannas Preserve State Park[8]. A wetland evaluation was conducted to locate, describe, and evaluate the wetlands within the project area and the results were summarized in a *Wetlands Evaluation Report* (WER). The WER was prepared in conformance with Part 2, Chapter 18 of the *PD&E Manual*.

[8] The portion of the Savannas Preserve State Park west of U.S. 1 (western tracts of the Savannas Preserve State Park) was originally known as the North Fork St. Lucie River State Buffer Preserve. It was managed by Coastal and Aquatic Managed Areas (CAMA) until December 2003 when these lands were transferred to the FDEP's Division of Recreation and Parks (as were other buffer preserve tracts across the state).



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Field Noise Measurement Locations

Figure 4.7

Field surveys were conducted by qualified biologists to classify and map natural habitats, to identify wetlands, and to assess the land use patterns along the build alternatives. Wetland and upland habitats were mapped based on field surveys conducted on August 30-September 1, 2003; October 6-10, 2003; December 13-15, 2004; February 16-17, 2004; September 24-25, 2008, and October 14-17, 2008. Wetland (and upland) habitats were classified using the definitions of *Florida Land Use, Cover and Forms Classification System* (FLUCCS) and the USFWS *Classification of Wetlands and Deepwater Habitats of the United States.* Habitat classifications were assigned based on the definitions of each classification system.

The location and extent of jurisdictional wetlands within the right of way for each of the build alternatives were verified by the USACE and SFWMD, with additional field coordination by the U.S. Environmental Protection Agency (USEPA), National Marine Fisheries Service (NMFS), and FDEP. The presence and the boundaries of jurisdictional wetlands and surface waters throughout the study area were identified using the USACE *Wetlands Delineation Manual*, Technical Report Y-87-1, January 1987 *(Federal Manual)* and Chapter 62-340 FAC, "Delineation of the Landward Extent of Wetlands and Surface Waters." The 1987 *Federal Manual* is the current accepted methodology developed jointly by the USACE[9], the USEPA, the USFWS, and the U.S. Department of Agriculture's (USDA) Natural Resource Conservation Service (NRCS). Agency-verified boundary maps within the right of way for each of the build alternatives were supplied by American Consulting Engineers of Florida, LLC in November 2008. Outside the rights of way, wetlands (and uplands) were identified and mapped using existing maps and background data, field observations, and the definitions of habitat classifications.

The open water/wetland boundary was field identified by canoe on June 16-18, 2003. The landward extent of wetlands bordering the NFSLR, Evans Creek, Hogpen Slough, South Coral Reef Waterway, and North Coral Reef Waterway were delineated following Chapter 62-340 FAC and the *Federal Manual*. This boundary was delineated at the mean high water line in this tidally influenced system. Mean high water was determined by examining driftlines, water stains on mangrove roots or other vegetation, and the waterward extent of hydrophytic vegetation. The boundary points were recorded using a differential GPS survey unit (Trimble®) and mapped.

The North Fork St. Lucie River Aquatic Preserve Management Plan (August 2009) was reviewed for information relevant to an evaluation of the existing wetland (and upland) habitats that could be affected by the proposed project. Coordination with the USACE indicated that the project area is located within the Indian River Lagoon South (IRL–S) - North Fork Natural Floodplain Restoration [Comprehensive Everglades Restoration Plan (CERP)] Project. The purpose of the IRL–S project is to capture water runoff from the C-44, C-23, C-24, and Northfork and Southfork basins for flood flow attenuation to the St. Lucie River Estuary. The project design is expected to provide water quality improvements to the Indian River Lagoon and the St. Lucie River Estuary by reducing nutrients, pesticides, and suspended materials conveyed in runoff[10]. One of these projects is the North Fork Natural Floodplain Restoration. The purpose of this project is land acquisition, water quality improvement, and restoration of wetland and floodplain functions within the NFSLR floodplain.

[9] An Interim Regional Supplement to the 1987 Wetland Delineation Manual for the Atlantic and Coastal Plain Region was released on December 4, 2008 by USACE via a Public Notice. The Public Notice states that the use of the original 1987 Manual is appropriate in cases where the field data was collected prior to the effective date of the Public Notice (January 4, 2009).
[10] http://www.evergladesplan.org/pm/projects/proj_07_irl_south.aspx; accessed 1/3/12.

4.3.5.1 Existing Wetland Conditions

A detailed description of the functions and importance of each wetland is contained in the WER. This information was verified by field surveys by biologists from the USACE, NMFS, SFWMD, and the FDEP. Based on this review, the project area can be characterized as a complex of freshwater wetlands (Palustrine), brackish water wetlands (Estuarine) and adjacent upland communities. These habitats are influenced by tidal activity as well as freshwater inputs from adjacent developed lands and upstream sources. Some habitats show relatively low wetland functions due to adjacent disturbance or by the colonization by invasive exotics; other habitats show relatively moderate to high quality wildlife habitat due to its unaltered state or position within several other habitat types.

Based on the field investigations, each wetland type was classified based on the FLUCCS classification system and the USFWS classification system. Habitat types were agency verified (USACE, USEPA, NMFS, SFWMD, and FDEP). Each habitat type is identified by its FLUCCS name and code and then by its USFWS classification name. The FLUCCS map is shown in **Figure 4.8;** the USFWS classification map is shown in **Figure 4.9**; the wetland and upland areas are shown in **Figure 4.10**; pond locations are shown in **Figure 4.11**. The wetland assessment areas (AA)[11] are shown in **Figure 4.12** [Section 4.3.5.2 (Wetland Evaluations)]. The entire acreage of each wetland polygon (or wetland type) within the project area is not given in this section because, for some wetlands, it is not useful to estimate their total size (in acres). The wetlands are part of a riverine system that extends far beyond the project area. However, impacts are determined in acres (and functional loss) for each wetland for each build alternative [Section 5.3.5 (Wetlands)].

4.3.5.1.1 Mangrove Swamps - 612; Estuarine Intertidal Scrub-Shrub Wetland; AA1

This habitat borders the open water channel of the NFSLR and Evans Creek, usually as a narrow fringe between the river channel and the interior marshes or forested wetlands. It is found throughout the project area as a narrow fringe (**Figures 4.8** and **4.9**) and is dominated by red mangrove (*Rhizophora mangle*), clumps of white mangrove (*Laguncularia racemosa*), leather fern (*Acrostichum danaeifolium*), cabbage palm (*Sabal palmetto*), and varying densities of Brazilian pepper (*Schinus terebinthifolius*). This habitat is more common along the channels on the southern end of the project area on both the NFSLR and Evans Creek. The northern part of the project area has lower salinities and mangroves become less dominant.

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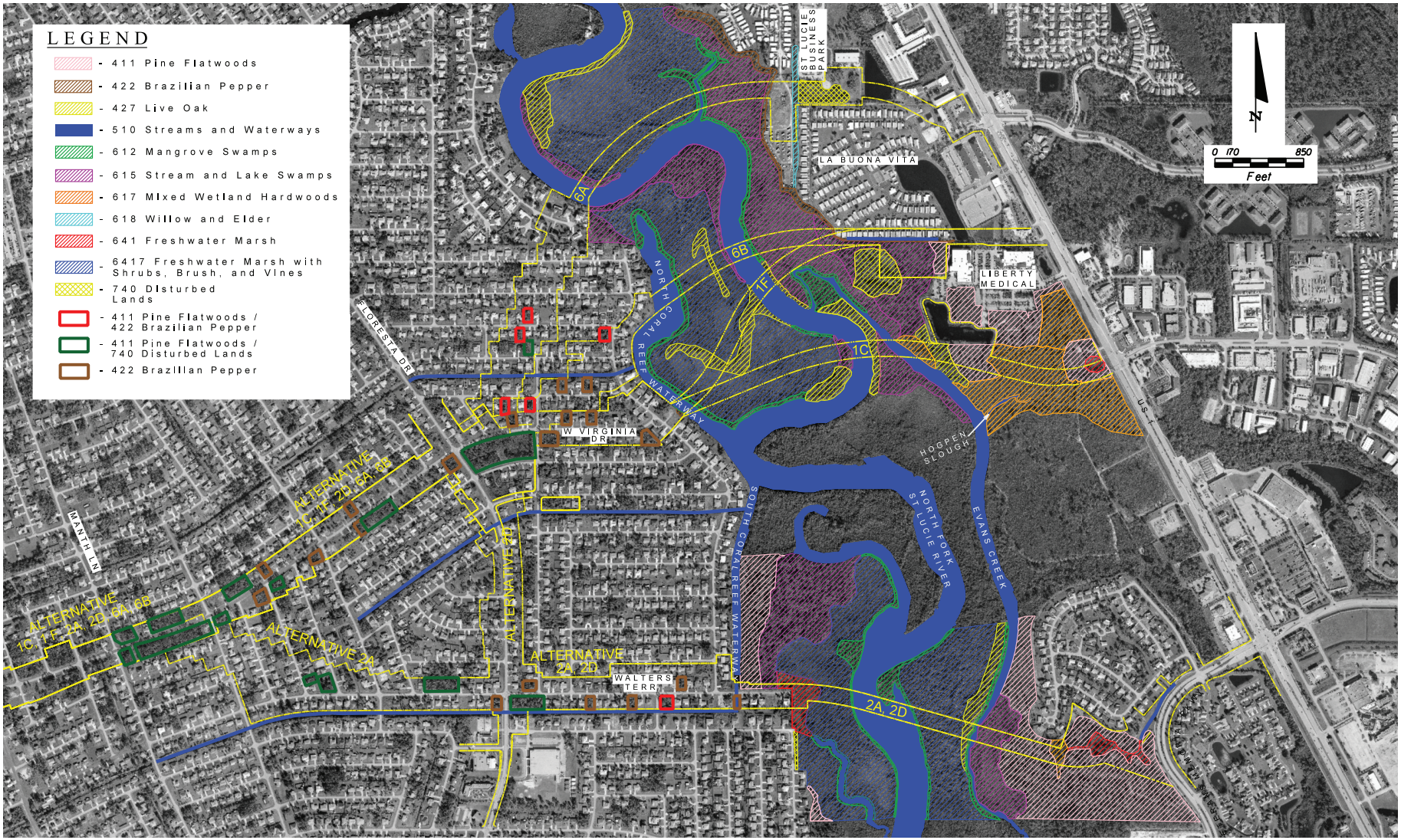
[11] Wetland Assessment Areas (AA) are used for the Uniform Mitigation Assessment Method (UMAM) and are discussed in Section 4.3.5.2 (Wetland Evaluations).



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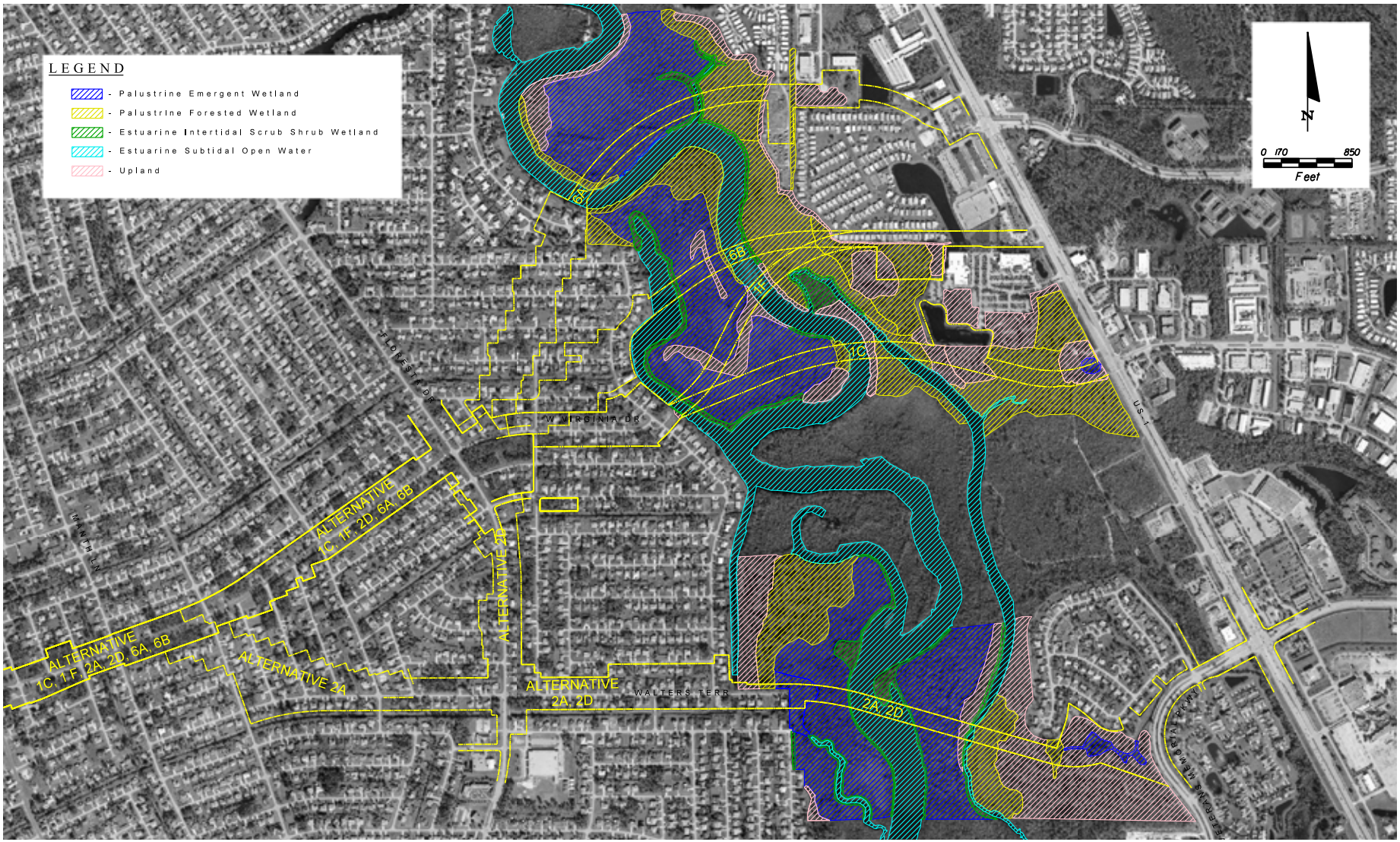
Florida Land Use, Cover and Forms Classification (FLUCCS) Map

Figure 4.8



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ETDM No. 8247

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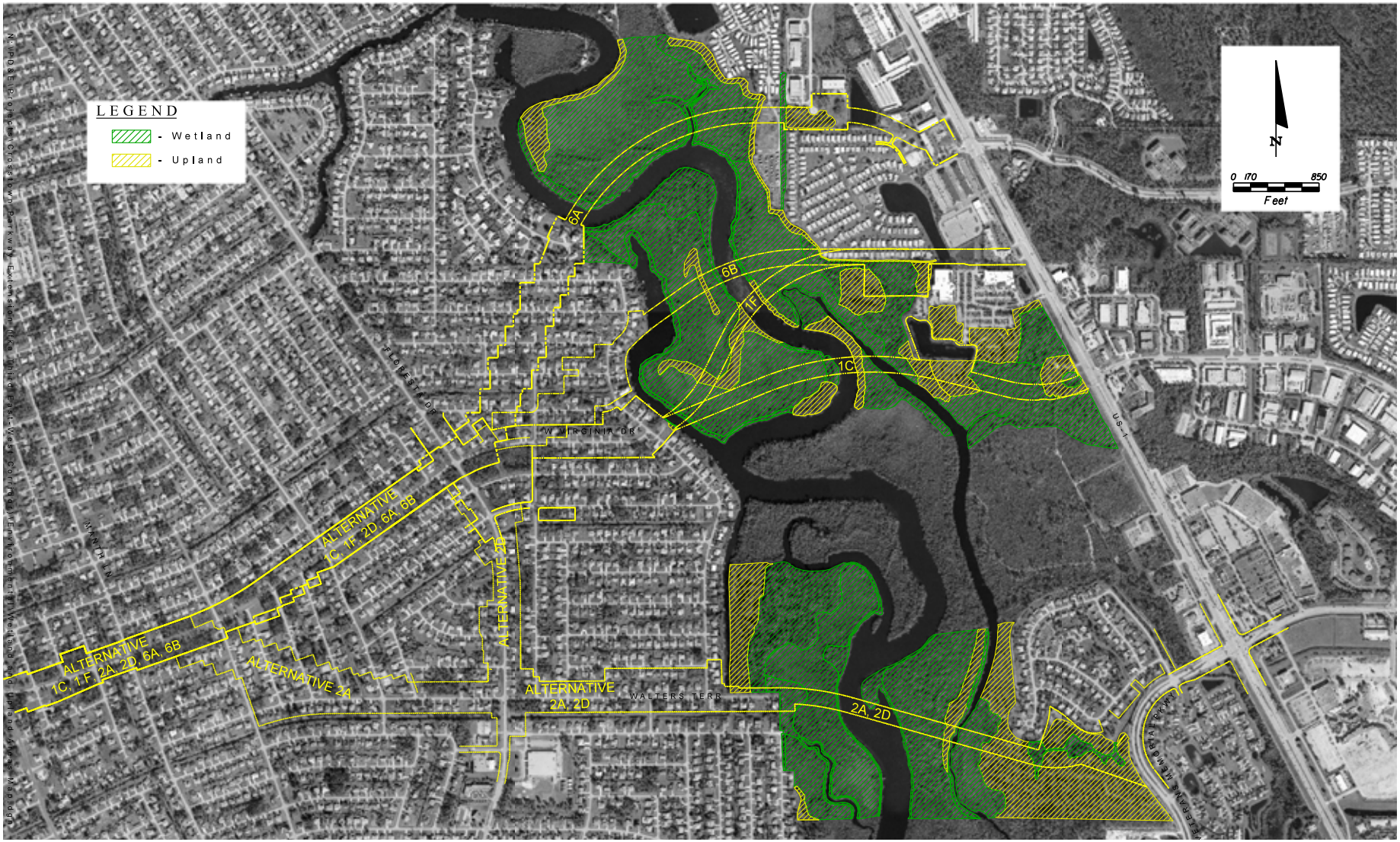
U.S. Fish and Wildlife (USFWS) Classification System Map

Figure 4.9



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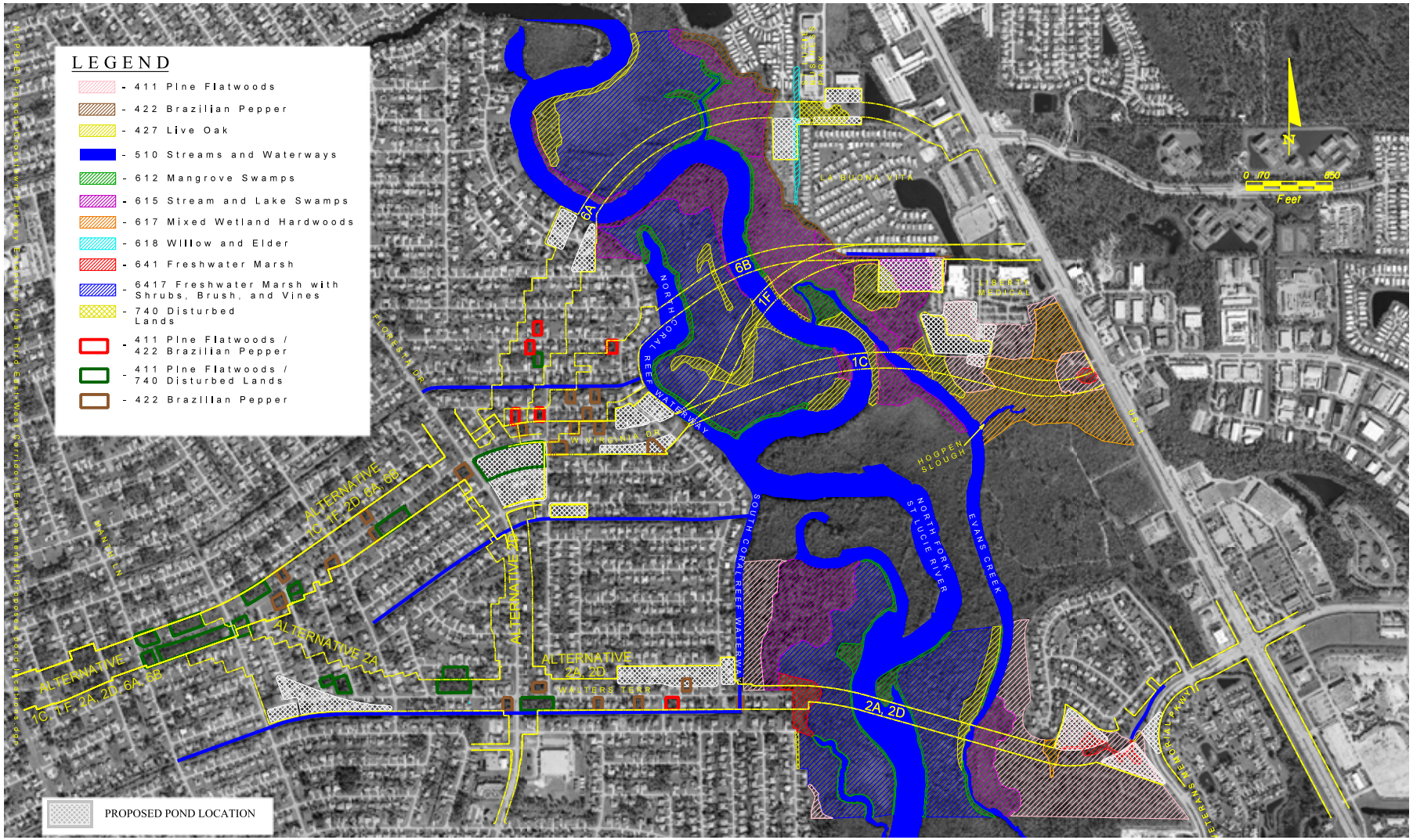
Wetland and Upland Areas Map

Figure 4.10



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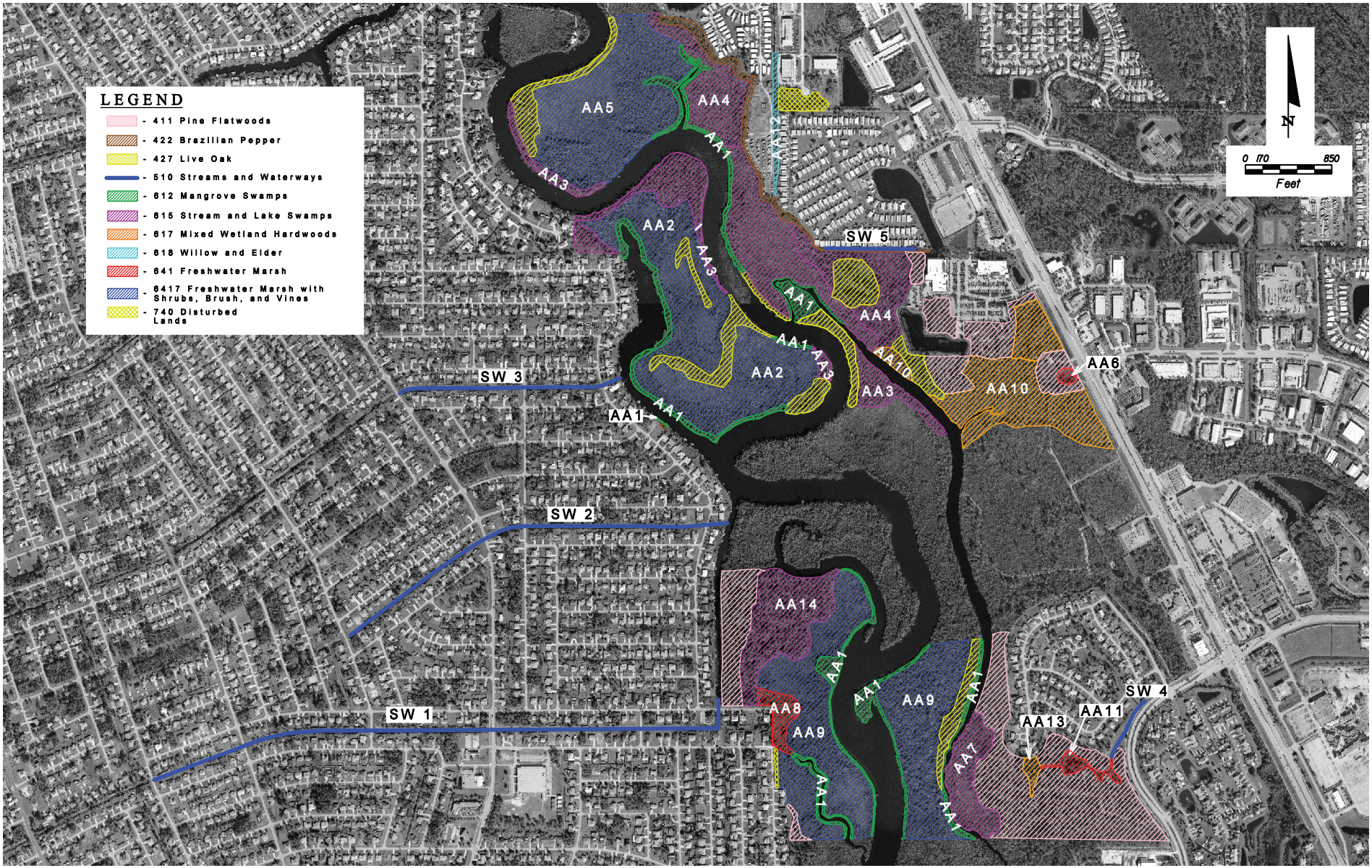
Proposed Pond Locations

Figure 4.11



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Assessment Area Map (AA)

Figure 4.12

4.3.5.1.2 Stream and Lake Swamps - 615; Palustrine Forested Wetland; AA3, AA4, AA7, and AA14

This habitat can be found immediately adjacent to the NFSLR and to Evans Creek, as well as in lowland areas near the River. It often forms the transition between the NFSLR or other wetland habitats and upland communities. These swamps are directly influenced by the water elevations of the River and Creek; in some places, these swamps may also receive some stormwater runoff from upland sources. They are dominated by hardwoods such as red maple (*Acer rubrum*), dahoon holly (*Ilex cassine*), red bay (*Persea borbonia* var. *borbonia*), wax myrtle (*Myrica cerifera*), water hickory (*Carya aquatica*), water ash (*Fraxinus caroliniana*), and occasionally, widely scattered slash pine (*Pinus elliottii*), and live oak (*Quercus virginiana*) on areas of slightly higher elevations. It has a varied understory of saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), swamp fern (*Belchnum serrulatum*), royal fern (*Osmunda regalis* var. *spectabilis*), cinnamon fern (*O. cinnamomea*) and a number of other herbaceous species. Brazilian pepper is present in scattered dense clumps, particularly in the northern part of the project area near developed properties where it becomes the dominant species.

4.3.5.1.3 Mixed Wetland Hardwoods – 617; Palustrine Forested Wetland; AA10 and AA13

This habitat is found on the Liberty Medical property located north of the Savannas Preserve State Park. It is part of a conservation area established as a permit condition for the construction of the Liberty Medical Center. Another area is located within the Savannas Preserve State Park and it is connected to the Liberty Medical forested area. A third area is found south of Oakmont Lane, west of Veterans Memorial Parkway. These habitats are a mixture of pine flatwoods and forested wetland communities. They are dominated by widely-spaced slash pines and clumps of saw palmetto with a hardwoods canopy of red bay, dahoon holly, and wax myrtle. The understory contains varied herbaceous species, such as swamp, cinnamon, and royal ferns. Brazilian pepper is present in scattered clumps.

4.3.5.1.4 Willow and Elder – 618; Palustrine Forested Wetland; AA12

This habitat is located between La Buona Vita residential community and a recreational vehicle storage area. It is a poorly-maintained ditch dominated by coastal plains willow (*Salix caroliniana*), Peruvian primrosewillow (*Ludwigia peruviana*), cattail (*Typha domingensis*), swamp rosemallow (*Hibiscus grandiflorus*), and dense stands of Brazilian pepper on both ditch banks.

4.3.5.1.5 Freshwater Marsh - 641; Palustrine Emergent Wetland; AA6, AA8, and AA11

Three freshwater marshes were mapped in the study area. They have relatively deep water with a long hydroperiod and have varying types of vegetation. The marsh at the end of Walters Terrace has a dense stand of cattails, with coastal plain willow, buttonbush (*Cephalanthus occidentalis*), and wax myrtle. The marsh in the vicinity of Veterans Memorial Parkway contains a dense community of Peruvian primrosewillow, and Japanese climbing fern (*Lygodium japonicum*). Other emergent vegetation, such as duck potato (*Sagittaria latifolia*), swamp fern, and pickerelweed (*Pontederia cordata*) are also present. The marsh located south of Liberty Medical is dominated by maidencane (*Panicum hemitomon*), peelbark St. John's wort (*Hypericum fasciculatum*), and dog fennel (*Eupatorium capillifolium*). Wax myrtle, buttonbush, and coastal plain willow can be found along its south side.

4.3.5.1.6 Freshwater Marsh, with Shrubs, Brush and Vines - 6417; Palustrine Emergent Wetland; AA2, AA5, and AA9

This habitat is found behind the fringe of the mangrove swamps and also immediately adjacent to the River or Evans Creek. These areas are influenced by the hydroperiod of the River and may be seasonally or episodically flooded. These flows may be impeded in some places by the presence of spoil piles or dense vegetation along the riverbanks. These marshes are dominated by sawgrass (*Cladium jamaicense*), leather fern, coin vine (*Dalbergia escataphyllum*), twinevine (*Sarcostemma clausum*), mangrove vine (*Rhabdadenia biflora*), greenbrier (*Smilax* spp.), and a variety of herbaceous species. They are also infested with dense clumps of Brazilian pepper. Red maple, pond apple (*Annona glabra*), and white mangrove are also present, with scattered cabbage palm and live oak on areas of slightly higher elevation.

4.3.5.2 Wetland Evaluations

Wetland evaluations were completed for existing conditions using the Uniform Mitigation Assessment Method (UMAM), which is the mandated functional assessment evaluation method in the State of Florida. UMAM is accepted by the USACE for the evaluation of wetlands in Florida. Functions and values of the wetlands were evaluated for existing conditions for each AA. An AA was defined as a polygon mapped for wetland habitats (habitat types for the FLUCCS and USFWS classification system). This approach resulted in 14 AAs (**Figure 4.12**). Some AAs are a single wetland type/polygon (e.g., Mangrove Swamps) or may comprise several polygons (e.g., Stream and Lake Swamps) that have similar wetland and habitat characteristics. In some cases, where several polygons are grouped, they were evaluated together and given a single UMAM score.

On December 17, 2008 and January 7, 2009, an interagency team[12] met to determine UMAM scores for the 14 AAs in the project area and the results of the baseline evaluations are summarized in **Table 4.5**. UMAM worksheets are contained in the WER and give the rationale for the scoring of each AA. The results of the UMAM evaluations for existing conditions resulted in scores ranging from 0.53 to 0.90. These scores mean that the wetlands in the project area are performing 53 to 90 percent of the functions of ideal comparable wetlands.

4.3.6 Aquatic Preserves

The Florida Aquatic Preserve Act (Chapters 253 and 258 FS) established a standardized set of management criteria for all designated aquatic preserves in Florida. In the Act, the state identified the need to preserve state-owned submerged lands in areas that have exceptional biological, aesthetic, and scientific value. As a State Aquatic Preserve, the area is characterized as an "Outstanding Florida Water" [Section 4.3.8 (Outstanding Florida Waters)].

[12] The interagency team was represented by SFWMD, FDEP (CAMA), USACE, USEPA, and NMFS.

Table 4.5 Summary of the UMAM Scores for Existing Conditions

Assessment Area (AA)	FLUCCS	USFWS	UMAM Score
AA 1	Mangrove Swamps	Estuarine Intertidal Scrub	0.87
AA 2	Freshwater Marsh with Shrubs, Brush and Vines	Palustrine Emergent	0.90
AA 3	Stream and Lake Swamps	Palustrine Forested	0.80
AA 4	Stream and Lake Swamps	Palustrine Forested	0.70
AA 5	Freshwater Marsh with Shrubs, Brush and Vines	Palustrine Emergent	0.83
AA 6	Freshwater Marsh	Palustrine Emergent	0.73
AA 7	Stream and Lake Swamps	Palustrine Forested	0.87
AA 8	Freshwater Marsh	Palustrine Emergent	0.57
AA 9	Freshwater Marsh with Shrubs, Brush and Vines	Palustrine Emergent	0.83
AA 10	Mixed Wetland Hardwoods	Palustrine Forested	0.83
AA 11	Freshwater Marsh	Palustrine Emergent	0.63
AA 12	Willow and Elder	Palustrine Forested	0.53
AA 13	Mixed Wetland Hardwoods	Palustrine Forested	0.80
AA14	Stream and Lake Swamps	Palustrine Forested	0.73

The project area is located within the North Fork St. Lucie River Aquatic Preserve (AP). The AP is located primarily within St. Lucie County, with a large portion located within the City. The southern boundary of the AP is located just south of the Martin County line (south to Jenkins Point and Coconut Point in Martin County) and the northern boundary is south of Midway Road (CR 712) in White City. In its entirety, the AP encompasses 2,972 acres of surface water area along 16 river miles of the NFSLR[13]. The portion of the AP in the project area is located within the main and secondary channels of the NFSLR, Evans Creek, Hog Pen Slough, South Coral Reef Waterway, and North Coral Reef Waterway (**Figure 4.8**). As described in Florida Statute and the Florida Administrative Code, the AP is defined as sovereignty submerged lands located waterward of the ordinary or mean high water line.[14] Thus, the project area and all build alternatives are located within the boundaries of the AP. The FHWA has also determined that the AP is a Section 4(f) resource [Section 6.0 (Section 4(f) Evaluation)].

4.3.7 Water Quality

The Federal Water Pollution Control Act, commonly known as the CWA (Public Law 92-500), as amended, authorizes the USEPA to establish regulations to prevent, reduce, and eliminate pollution of waters of the United States and develop quality standards for surface waters[15]. The objective of the act is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. Federal agencies are required to comply with all federal, state, interstate, and local water pollution control requirements both substantively and procedurally. The CWA provides the statutory basis for the state water quality standards programs. Section 401 of the CWA includes Water Quality Certification requiring states to certify

[13] http://www.dep.state.fl.us/coastal/sites/northfork/default.htm; accessed on 1/3/2012.
[14] Florida Statute 258.39 and Rule Chapter 18-20 Florida Administrative Code.
[15] http://www.epa.gov/lawsregs/laws/cwa.html; accessed on 1/3/2012.

compliance of federal permits or licenses through the State Water Quality Certification program and ensure that actions are consistent with the water quality regulations of the State of Florida. Section 402 of the CWA requires USEPA to implement the National Pollution Discharge Elimination System (NPDES). The USEPA regulates these programs in accordance with Title 40, Chapter I, Part 131, Code of Federal Regulations (40 CFR 131). The Safe Drinking Water Act, as amended, Public Law 93-523, requires ground water quality to be maintained to protect human health, the environment, and ground water resources. Coordination with USEPA must occur if there is a potential for contamination of a designated sole source aquifer. Documentation on the USEPA website[16] confirms that the project area is not located within the boundaries of a sole source aquifer. Therefore, coordination with USEPA on this issue is not required for this project.

In the State of Florida, the Water Resources Act, the Florida Air and Water Pollution Control Act, and the State Comprehensive Plan address conservation and protection of the state's water resources (Chapter 62-40 FAC). Surface water quality standards are published in Chapter 62-302 FAC. Components of this system include water classifications criteria, an anti-degradation policy, and special protection of certain waters (e.g., Outstanding Florida Waters). The FDEP Ground Water Regulatory Program is responsible for implementation and support of regulatory programs affecting groundwater quality under Chapter 62-520 FAC.

The FDEP manages water quality and quantity through the five water management districts. The Water Resources Act directed the FDEP to delegate water resource programs to the water management districts, where possible. The project area is located within the jurisdiction of the SFWMD. Regulatory authority under programs delegated to the SFWMD includes water use (dewatering and irrigation), well construction, and surface water management. In October 2000, FDEP was authorized by the USEPA to implement the NPDES stormwater permitting program in Florida. The NPDES stormwater program under Chapter 62-621 FAC, regulates point source discharges of stormwater into surface waters of the state from municipal, industrial, and construction activities. As the NPDES permitting authority, FDEP is responsible for reviewing permit applications, issuing permits, and performing compliance and enforcement actions.

Surface waters subject to these federal and state provisions are present in the main and secondary channels of the NFSLR, Evans Creek, Hogpen Slough, South Coral Reef Waterway, and the North Coral Reef Waterway. They are waters of the State of Florida and are classified as Class III waters. Class III waters are designated as being used for "recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife" (Chapter 62-302 FAC, Surface Water Quality Standards). In addition, NFSLR is designated as an Outstanding Florida Water (OFW), pursuant to Section 62-302.700(9) FAC, and is afforded special protection because of its natural attributes [Section 4.3.8 (Outstanding Florida Waters)]. Under the authority of Section 303(d) of the CWA, USEPA requires that Total Maximum Daily Loads (TMDLs) be developed in areas where existing regulations are not stringent enough to protect water quality. TMDLs are derived from quantitative analyses of water bodies, where one or more water quality standards are not being met. The goal is to identify management strategies necessary to attain water quality standards. In Florida, waters not meeting the water quality standards applicable to their designated water classification, are referred to as "impaired waters" and are assigned a Waterbody Identification

[16] http://www.epa.gov/region4/water/groundwater/r4ssa.html; accessed on 1/3/2012.

Number (WBID). The receiving waters in the study area have been identified as impaired waterbodies pursuant to Section 62-304.705 FAC and have been assigned WBID 3194.[17] The identified impairments for WBID 3194 include nitrogen, phosphorus and biological oxygen demand (BOD). Five drainage ditches or swales (surface waters; SW) are also located in the project area. The limits of the waters located in the project area are shown in **Figure 4.8**.

The potential for adverse impacts to water quality were evaluated during construction or the operation of any of the build alternatives. Thus, water quality and quantity impacts were examined by preparing technical support documents titled, *Preliminary Drainage Report* and *Pond Siting Report.* The *Drainage* and *Pond Siting Reports* were prepared to comply with Chapter 40E-4 FAC (Environmental Resource Permits), Chapter 14-86 FAC (Rules of the Department of Transportation, FDOT *Drainage Manual*, and other federal and state statutes and regulations, including Section 373.4596 FS, and Chapters 62-25 and 62-40 FAC, (goals and requirements for surface water protection and management implemented by the FDEP and the Water Management Districts). The FDEP indicated that all build alternatives have the potential to alter existing surface water hydrology and natural drainage patterns and potential reduction in flood attenuation capacity of area creeks, ditches, and sloughs as a result of increase impervious surface within the watershed. Thus, the technical support document titled *Location Hydraulic Report* was prepared in compliance with Part 2, Chapter 24 of the *PD&E Manual.*

The City's existing drainage system is currently designed to accommodate the stormwater runoff from private communities and residential developments. The existing roadways drain via a system of swales and culverts to a system of drainage canals within the City limits that eventually convey stormwater to the NFSLR. Grassed swales provide the primary mechanism for stormwater conveyance, attenuation, and treatment for water quality through percolation and infiltration. The stormwater runoff sheet flows from adjacent lands and parcels into the swales before discharging into the local canal system, which ultimately discharges to the NFSLR. The stormwater management system east of NFSLR along U.S. 1, north of Port St. Lucie Boulevard, is currently drained by a system of curb inlets, ditch bottom inlets, closed flume inlets, cross drains, and side drains. Stormwater runoff is conveyed by a roadside treatment swale west of U.S. 1 prior to discharging into the NFSLR. Several control structures and ditch blocks located along U.S. 1 allow for additional detention and regulate discharge rates.

This existing drainage system predates many of the stipulated water quality and water quantity requirements as well as allowable discharge rates set forth by the SFWMD. More specifically, the local canal system does not meet current SFWMD dimensional criteria for water quality treatment. However, in general, the existing stormwater management system provides adequate flood protection and no substantial localized ponding has been noted within the project area.

4.3.8 Outstanding Florida Waters

The Florida surface water quality standards system is published in Chapter 62:302 FAC. The components of this system include classifications, criteria, an anti-degradation policy, and special protection of certain waters, including Outstanding Florida Waters (OFW). The NFSLR has been designated as an OFW (Section 62.302.700 (9) FAC) within the project area because this portion of the NFSLR is located within an

[17] http://dep.state.fl.us/water/tmdl, accessed 8/12/12.

aquatic preserve [Section 4.3.6 (Aquatic Preserves)]. These waters are protected through stricter discharge and use limits than waters not so designated (no degradation of water quality is permitted for an OFW). Through agency coordination, the SFWMD indicated the surface water management system must include anti-degradation assurances. The SFWMD recommended that any build alternative provide 150 percent of the standard water treatment and also recommended all stormwater runoff be directed through the surface water management system so that no direct discharge (e.g., through scuppers[18]) will occur to OFW. Dewatering activities will require a water use permit. A detailed discussion of water quality standards is contained in Section 4.3.7 (Water Quality).

4.3.9 Contamination

Through agency coordination, the FDEP identified several potential hazardous waste sites within the project area. Thus, a contamination screening evaluation was conducted for the project area to identify and evaluate known or potential contamination problems within the project area, particularly within the areas of the build alternatives. The screening evaluation was prepared in accordance with *PD&E Manual*, Part 2, Chapter 22, which takes into consideration the numerous federal and state regulations for hazardous and toxic substances. Details of the contamination screening evaluation are contained in the technical support document titled *Contamination Screening Evaluation Report*.

If a project is planned in an area that is contaminated, the project may have additional costs that are associated with avoiding the contamination or the cleanup. Further, discovering contamination during construction can expose personnel to hazardous substances and can stop construction. Therefore a contamination screening was performed for this project to assess potential contamination issues. Known contamination sites and potential contamination sites were identified by several methods, including:

- Reviewing enforcement agency databases and government records for a radius of one mile around the alignments;
- Reviewing historical city directories for past ownership and use of properties along the alternatives;
- Reviewing historical aerial photographs to determine the past uses of the project area and to search for photographic evidence of potential contamination sites; and
- Performing reconnaissance and interviews in December 2008 to verify information collected and to identify other properties that were potential environmental concerns.

The assessment was conducted using existing documents and records; field testing such as soil and groundwater sampling was not performed. Each site was assigned a risk level according to the guidelines contained in *PD&E Manual*, Part 2, Chapter 22, Section 22-2.2.3. The contamination rating system is divided into four degrees of risk: No; Low; Medium; and High. This system expresses the degree of concern that known or potential contamination may have on the project.

No documented contamination was found to exist within the footprints of any of the build alternatives, including the Preferred Alternative. However, several sites within the footprints of the build alternatives may contain undiscovered contamination now, or may have storage tanks or other sources that could release contamination during the planning, design, or construction of a build alternative. Further, sites are located within a 1-mile radius of the build alternatives, including the Preferred Alternative, that are known to

[18] Scuppers are openings at the edge of the bridge deck to allow water to drain directly into the receiving waters.

be contaminated and may contain undiscovered contamination now or may become contaminated in the future. It is possible that contamination from some of these sites has or will migrate through surface water or groundwater. Although no documented contamination is known to exist within the footprints of any of the alternatives, the contamination screening identified 93 sites with potential contamination concerns. Sites with Medium or High ratings are summarized by alternative in **Table 4.6** and are discussed in the *Contamination Screening Evaluation Report*. Contamination issues are generally limited to small groundwater plumes of petroleum near the alternatives, the possibility of a solvent release from a drycleaner, or a petroleum release from an underground storage tank. There is no evidence of major contamination that would prevent construction of any of the build alternatives, including the Preferred Alternative. In addition there is no evidence that contamination will incur a substantial cost, will affect a construction schedule, or that construction of the any of the build alternatives, including the Preferred Alternative, would spread existing contamination. A Phase 2 contamination screening, including field testing of soil and groundwater, will be performed to more fully assess potential contamination during the design phase.

Table 4.6 Contamination Potential Comparison by Build Alternative

	Alternative					
Ratings	**1C**	**1F**	**2A**	**2D**	**6A**	**6B**
High Risk	None	None	Site #44 Mobil Mart gas station 9200 South Federal Highway Gas station with groundwater plume	Site #44 Mobil Mart gas station 9200 South Federal Highway Gas station with groundwater plume	Site #16 Hess gas station 8580 Federal Highway Groundwater plume undergoing passive remediation	None
Medium Risk	Site #30 Ron's Auto Body 8890 South Federal Highway Possibility of petroleum contamination in the groundwater Site #31 BP Gas Station, 8898 South Federal Highway Possibility of petroleum contamination in the groundwater	Site #69 Coin Laundry and Dry Cleaning 8745 South Federal Highway Possibility of dry cleaning solvent contamination in the groundwater	Site #66 Airoso Cleaners, 9170 South Federal Highway Possibility of dry-cleaning solvent contamination in the groundwater	Site #66 Airoso Cleaners, 9170 South Federal Highway Possibility of dry-cleaning solvent contamination in the groundwater	Site #68a One Price Cleaner 8619 South Federal Highway Possibility of dry cleaning solvent contamination in the groundwater	Site #69 Coin Laundry and Dry Cleaning, 8745 South Federal Highway Possibility of dry-cleaning solvent contamination in the groundwater

4.3.10 Wild and Scenic Rivers

The Wild and Scenic Rivers Act of 1968 (Act; 16 USC 1271) protects certain selected rivers which, "…with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations." The Act prohibits federal support for actions, such as instream activities that would diminish the river's free flow or outstanding resource values. The Act specifically protects outstanding natural, cultural, or recreational values; ensures water quality is maintained; and requires the creation of a comprehensive river management plan that addresses resource protection, development of lands and facilities, user capacities, and other management practices necessary to achieve purposes of the Act. Consideration of Wild and Scenic Rivers was evaluated in accordance with *PD&E Manual*, Part 2, Chapter 23.

Under Section 5(d)(1) of the Act, the Department of the Interior (DOI) National Park Service (NPS) River and Trail Conservation Assistance Program (RTCA), within the NPS National Center for Recreation and Conservation (NCRC), maintains a Nationwide Rivers Inventory (NRI) of river segments that could qualify for inclusion in the National Wild and Scenic River System, but which have not yet been so designated. The President's 1979 Environmental Directive on Wild and Scenic Rivers (August 2, 1979) directs federal agencies to avoid or mitigate adverse effects on rivers identified in the NRI as having potential for designation under the Act. The August 10, 1980 Council on Environmental Quality (CEQ) "Interagency Consultation to Avoid or Mitigate Adverse Effects of Rivers in the Nationwide Inventory" requires federal agencies to consult with National Parks Service (NPS) when proposals may affect a river or a river segment included in the NRI. Further, the "National Wild and Scenic Rivers System – Final Revised Guidelines for Eligibility, Classification, and Management of River Areas" (Federal Register Volume 47, Number 173, September 7, 1982) describes guidelines for the study of potential national wild and scenic rivers and management of designated rivers. These laws and guidance documents were used to evaluate the potential impacts of designated wild and scenic rivers in the project area.

A review of the NRI of the NPS Wild and Scenic Rivers Program web site[19] and the list contained in Chapter 23 of the *PD&E Manual* indicate that the NFSLR is not designated as a Wild and Scenic River nor is it a Study River. However, the NFSLR is listed on the NRI, from River Mile 0 at the confluence of the St. Lucie River at Stuart to River Mile 16 at the junction at Five Mile and Ten Mile Creek. Thus, the project area is located within a river segment listed on the NRI. It has been classified with the "Outstandingly Remarkable Values" of Scenery, Recreation, Fish, and Wildlife. A detailed description of these values that includes the aquatic and terrestrial habitats located in the project area and the river environment is contained in the section of this document that discusses Wetlands (Section 4.3.5) and Wildlife and Habitat (Section 4.3.14). Section 4(f) resource applicability is discussed in Section 6.0 (Section 4(f) Evaluation).

[19] www.nps.gov/rivers; accessed 1/3/2012.

4.3.11 Floodplains

EO 11988, *Floodplain Management*, directs federal agencies to take action to reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. USDOT Order 5650.2, *Floodplain Management and Protection,* contains USDOT policies and procedure for implementing EO 11988. Agencies are required to make a finding that there is no practicable alternative before taking action that would encroach on the 100-year base flood elevation (7 CFR Part 650.25). Floodplains for this study were evaluated in accordance with *PD&E Manual*, Part 2, Chapters 3 and 24. Floodplains were also part of the evaluation contained in the technical support document titled *Location Hydraulic Report*.

EO 11988 defines floodplains as "the lowland and relatively flat areas adjoining inland and coastal waters including flood-prone areas of offshore islands, including at a minimum, that area subject to a 1 percent or greater chance of flooding in any given year" (i.e., the area inundated by a 100-year flood). The 100-year flood has been adopted by the Federal Emergency Management Agency (FEMA) as the base flood for floodplain management purposes. FEMA uses the 500-year flood (i.e., a 0.2 percent annual chance of occurrence) to indicate additional areas of flood risk. EO 11988 requires federal agencies to determine whether a proposed action will occur in a floodplain and, if the encroachment is significant, determine if the proposed action is the only practicable alternative before proceeding. If the federal agency finds that the only practicable alternative requires siting in a floodplain, EO 11988 and USDOT Order 5650.2 require that the proposed action be designed or modified to reduce adverse floodplain impacts. FEMA maps are the primary reference for determining the extent of the base floodplain.

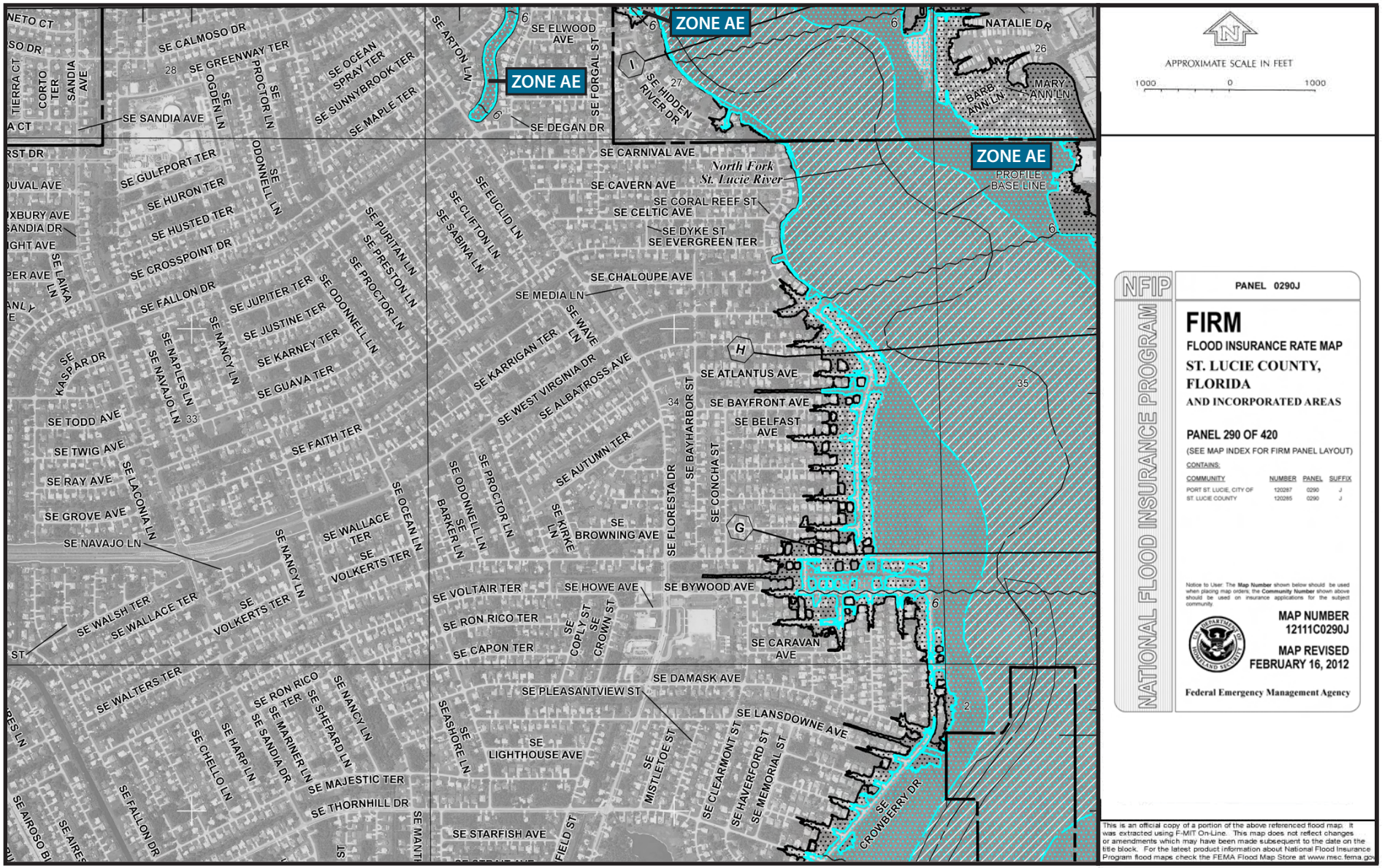
The project area is located within the 100-year floodplain as shown on the FEMA Flood Insurance Rate Maps (FIRM) for St. Lucie County (**Figures 4.13** and **4.14**). The 100-year flood elevation ranges between 8.0 feet National Geodetic Vertical Datum (NGVD) and 9.0 feet NGVD according to the FIRM panels 12111C0290J and 12111C0291J dated 2012.

The project area is located within a regulated floodway (NFSLR). Federal Aid Policy Guide, CFR 650A, requires identification and discussion of the extent of involvement in a regulated floodway. It also requires coordination with FEMA and local agencies to ensure the project's consistency with floodway guidance.

4.3.12 Coastal Zone Consistency

The Coastal Zone Management Act (CZMA) was enacted in 1972 to encourage coastal states to develop comprehensive programs to manage and balance competing uses of and impacts to coastal resources. The CZMA emphasizes that the coastal state has the primary decision-making powers regarding the coastal zone. Section 307 of the CZMA (16 USC Section 1456), called the Federal Consistency Provision, is a major incentive for states to join the National Coastal Management Program and is a powerful tool that states use to manage coastal uses and resources and to facilitate cooperation and coordination with federal agencies[20]. Consideration of Coastal Zone Consistency was evaluated in accordance with *PD&E Manual*, Part 2, Chapter 25.

[20] http://coastalmanagement.noaa.gov/consistency, accessed August 30. 2012.



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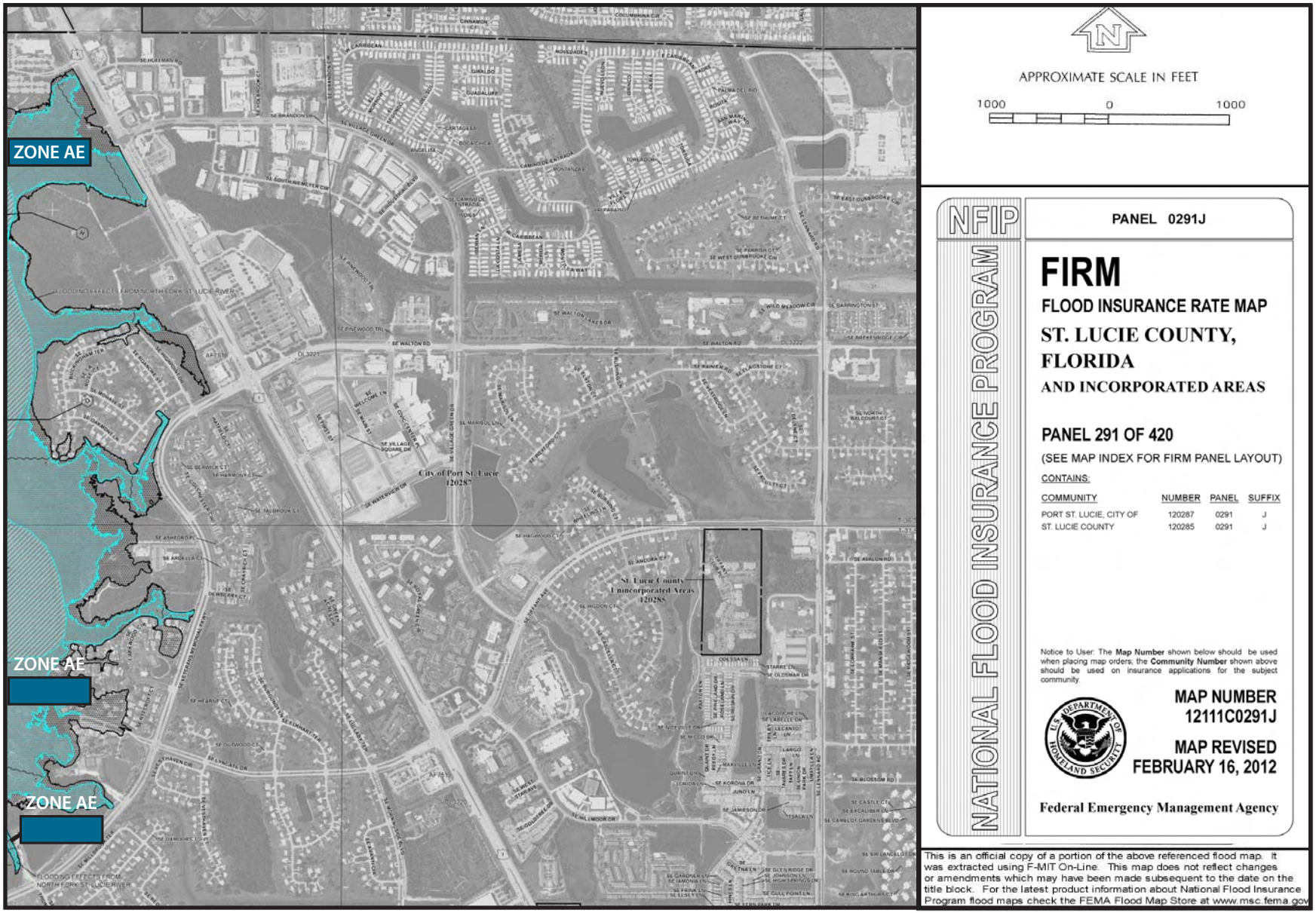
FP No. 7777-087-A
ETDM No. 8247

Crosstown Parkway Extension PD&E Study and Environmental Impact Statement

FEMA 100-Year Floodplain - Sheet 1 of 2

Figure 4.13



FM No. 410844-1-28-01
FP No. 7777-087-A
ETDM No. 8247

Crosstown Parkway Extension PD&E Study and Environmental Impact Statement

FEMA 100-Year Floodplain - Sheet 2 of 2

Figure 4.14

Federal consistency is the CZMA requirement where federal agency activities that have reasonably foreseeable effects on any land or water use or natural resource of the coastal zone must be consistent to the maximum extent practicable with the enforceable policies of a coastal state's federally approved coastal management program. The Florida Coastal Management Act of 1978 authorized the Florida Department of Environmental Regulation (now the Department of Environmental Protection) to develop a comprehensive Florida Coastal Management Program (FCMP). Florida's review of federal activities for consistency with the CZMA is coordinated by the State Clearinghouse (Clearinghouse). The Clearinghouse has determined that this project is consistent with the Florida Coastal Zone Management Program.[21]

4.3.13 Coastal Barrier Island Resources

Federal activities involving or affecting coastal resources are governed by the Coastal Barrier Resources Act (CBRA) of 1982, as amended by the Coastal Barrier Improvement Act of 1990, the CZMA, as amended, and revisions to the Local Coastal Comprehensive Plan under Part II, Chapter 163 FS. CBRA established the John H. Chafee Coastal Barrier Resources System (CBRS), comprised of undeveloped coastal barriers along the Atlantic, Gulf, and Great Lakes coasts. Congress designated various, undeveloped coastal barrier islands for inclusion in the CBRS using site-specific maps. Consideration of coastal barrier island resources was evaluated in accordance with *PD&E Manual*, Part 2, Chapter 26. The CBRS resources in the County include the barrier islands located between the Atlantic Ocean and the Indian River (Hutchinson Island), mapped as unit P-11. However, none of the identified coastal barrier resources are located within or in the vicinity of the project area.

4.3.14 Wildlife and Habitat

Section 7 of the Endangered Species Act (ESA), as amended, applies to federal agency actions and sets forth requirements for consultation to determine if a proposed action could potentially affect a federally-endangered or threatened species. The ESA requires federal agencies, in consultation with and with the assistance of the Secretaries of the Departments of Interior and Commerce, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of designated Critical Habitat[22] of such species. Under the law, the Secretary of the U.S. Department of Interior, acting through the USFWS and the Secretary of the U.S. Department of Commerce, acting through the NMFS, have broad powers to protect and conserve all forms of wildlife, plants, and marine life. Under Article IV, Section 9 of the Florida Constitution, the Florida Fish and Wildlife Conservation Commission (FWC) has management authority over the state's fish and wildlife resources. Chapter 379.2291 FS gives the FWC authority to conserve and manage state endangered species.

Through agency coordination, the USFWS and the FWC identified the aquatic habitats, the forested and emergent wetlands associated with or near to the NFSLR, and the adjacent upland habitats as having valuable functions and values, including habitat for listed plant and animal species. Both agencies

[21] Letter from the Florida State Clearinghouse, dated October 14, 2011 (**Appendix A**).

[22] Critical habitat is a specific area within the geographical area occupied by the species, which contain the physical or biological features essential to the conservation of the species and which may require special management considerations or protection.

indicated the project area is located within the AP and that all build alternatives, except for Alternative 6A, are located in Savannas Preserve State Park.[23] Both agencies identified several listed species that have the potential to occur within the project area and this information was used to develop the list of species that was evaluated [Section 4.3.14.2 (Threatened and Endangered Species)]. The species list was deemed "appropriate" by the USFWS.[24]

The FWC indicated that the project area is located within areas designated as Biodiversity Hotspots, Priority Wetlands (for wetland-dependent listed species). The FWC also identified the wetland and upland habitats within the project area as having moderate to high quality scores on the FWC's Integrated Wildlife Habitat Ranking System.

The Florida Natural Areas Inventory (FNAI) has determined that the project area meets the criteria for a Locally Significant Natural Area (LSNA).[25] In addition, FNAI identified several mapped occurrences of rare species and natural communities ("elements") within the vicinity of the project area (but not necessarily within the project area).

The North Fork St. Lucie Aquatic Preserve Management Plan (2009) was examined for information regarding the potential presence of listed species within the project area. The Management Plan identified a bird rookery, known to support wood stork and other wading birds, south of Port St. Lucie Boulevard (Mud Cove Rookery). Thus, the project is located within a Core Foraging Area[26] (CFA) for the wood stork.

An *Endangered Species Biological Assessment* (ESBA) was prepared to evaluate the potential effects of the build alternatives, including the Preferred Alternative. This section summarizes the existing conditions documented in the ESBA. The evaluation meets the requirements of Section 7 of the ESA of 1973, as amended, and was prepared in accordance with the *PD&E Manual,* Part 2, Chapter 27.

Qualified biologists conducted on-site field surveys on August 30-September 1, 2003, October 6-10, 2003, December 13-15, 2004, February 16-17, 2004, September 24-25, 2008, and October 14-17, 2008 to qualitatively document and describe the existing flora and fauna throughout the project area, with particular attention to the crossing alternatives. During the habitat mapping task, the biologists examined the habitats for occurrences of listed species. Habitats were classified on foot and by boat and used the definitions of the FLUCCS and USFWS classification method [Section 4.3.5 (Wetlands)]. Descriptions of wetland habitats are included in Section 4.3.5 (Wetlands); descriptions of submerged habitats are included in Section 4.3.15 (Essential Fish Habitat); descriptions of upland (non-wetland) habitats are included in this section. However, the discussion on the occurrences of listed plants and animals from all habitats (including the vacant residential lots) is included in this section.

[23] The portion of the Savannas Preserve State Park west of U.S. 1 (western tracts of the Savannas Preserve State Park) was originally known as the North Fork St. Lucie River State Buffer Preserve. It was managed by Coastal and Aquatic Managed Areas (CAMA) until December 2003 when these lands were transferred to the FDEP's Division of Recreation and Parks (as were other buffer preserve tracts across the state).

[24] Email received on February 20, 2009 (**Appendix A**).

[25] FNAI letter to the City, dated February 4, 2009, (**Appendix A**).

[26] Core foraging area for wood storks is defined in South Florida as an 18.6-mile radius around a known wood stork nesting colony. Adequate foraging is considered important for reproductive success.

4.3.14.1 Existing Listed Species Habitat

Habitat maps include all natural (undeveloped) habitats observed in the project area, including vacant residential lots west of the River. Based on the field investigations, each habitat type was classified based on the FLUCCS classification system and is identified by its FLUCCS name and code. The FLUCCS classification map is shown in **Figure 4.8**; the USFWS classification system map is shown in **Figure 4.9**; wetland and upland areas are shown in **Figure 4.10**. Upland forests are present in slightly higher elevations along the river shores. In general, larger areas of upland forests are present along the eastern portion of the project area, while smaller areas of upland forests are located on the western side of the project area. This section will describe the upland habitats. Wetland habitats are described in Section 4.3.5 (Wetlands) and habitats associated with the NFSLR are described in Section 4.3.15 (Essential Fish Habitat).

4.3.14.1.1 Pine Flatwoods – 411


Photo 4.5. Pine Flatwoods Habitat

Much of the upland habitat on the eastern side of the project area and areas adjacent to the residential communities on the western side of the River can be described as Pine Flatwoods (**Photo 4.5**). This community consists primarily of an open canopy of slash pine (*Pinus elliottii*) trees. The understory consists of varying dense stands of sand live oak (*Quercus geminata*), Chapman's oak (*Q. chapmanii*), and myrtle oak (*Q, myrtifolia*). The understory also contains saw palmetto (*Serenoa repens*), hog plum (*Ximenia americana*), rusty stagger bush (*Lyonia ferruginea*), and coastalplain staggerbush (*L. fruticosa*). This habitat also contains a high diversity of herbaceous species. Pine flatwoods are naturally maintained by periodic fires, which provide bare ground, low levels of litter, and open sand patches to support characteristic flatwoods species. The flatwoods habitats observed in the project area have dense understory layers and have few open areas, probably due to lack of periodic fires (either natural or prescribed burns). The pine flatwoods habitat intergrades with the Mangrove Swamps, Stream and Lake Forests, and Mixed Wetland Hardwoods at lower elevations near the River and Evans Creek. It also has small elements of a scrub community, which intergrades with the flatwoods community. These scrub elements have fewer slash pines and may be more recognizable because of past hurricane damage to the pine canopy. However, they appear to be located in areas with slightly higher elevations. These patches are characterized by widely scattered sand pine (*Pinus clausa*) and slash pine saplings.

4.3.14.1.2 Brazilian Pepper – 422

This habitat was observed along the slope west of La Buona Vita residential area and the St. Lucie Business Park on the northern part of the project area. This community is dominated by a dense stand of Brazilian pepper (*Schinus terebinthifolius*). This plant is considered a Category I invasive exotic by the

Florida Exotic Pest Plant Council.[27] Very little understory can be found beneath its dense canopy except for occasional Spanish needles (*Bidens alba*), creeping oxeye daisy (*Wedelia trilobata*), and some swamp fern (*Blechnum serrulatum*). This community can also be found on some of the vacant residential lots on the western side of the project area (**Figure 4.8**).

4.3.14.1.3 Live Oak - 427

This community was observed on slightly higher elevations either directly along the river banks or on slight rises inland of the River. This community was dominated by a well-established canopy of mature live oaks (*Quercus virginiana*) and cabbage palms (*Sabal palmetto*; along the riverbanks), with an understory of saw palmetto, wax myrtle (*Myrica cerifera*), myrsine (*Rapanea punctata*), and Virginia chain fern (*Woodwardia virginica*). One of these areas is located near the canoe stopover/dock at the Savannas Preserve State Park. It forms a fringe between the lower elevations of the forested wetlands and the upland pine flatwoods at a higher elevation. The area is dominated by a canopy of live oak and laurel oak (*Quercus laurifolia*), dahoon holly (*Ilex cassine*), wax myrtle, with an understory of saw palmetto, wild coffee (*Psychotria nervosa*) and gallberry (*Ilex glabra*). The oak canopy supports an abundant population of airplants (primarily *Tillandsia setacea, T. recurvata,* and an occasional *T. utriculata*). This habitat is also observed directly adjacent to the river shore on slight rises in elevation and may be present because of dredge spoil deposition during the dredging of the river channel decades ago. Some of these areas are extensive and could be mapped; others are small and could not be mapped at the scale of the aerial maps because they were located on scattered, slightly higher elevation areas, or intermixed with mangrove or stream and lake forest communities. Other live oak areas appear to be naturally occurring since they are located inland or along Evans Creek, which do not appear to have dredge spoil.

4.3.14.1.4 Disturbed Lands – 740

This area is located south of and is part of the stormwater treatment area for the St. Lucie Business Park. It has a deepwater portion in its center, surrounded by fill piles dominated by a dense forest of earleaf acacia (*Acacia auriculiformis*; seedling, saplings, and mature trees) and Brazilian pepper with a few widely scattered slash pines. The understory is dominated by dense torpedo grass (*Panicum repens*) with occasional swamp fern and cattails (*Typha domingensis*) where there are openings in the canopy. Both earleaf acacia and torpedo grass are categorized as Category I invasive exotic species. Another disturbed area is located south of Walters Terrace.

4.3.14.1.5 Pine Flatwoods/Brazilian Pepper – 411/422

This habitat was observed in the residential lots on the western side of the project area. They are remnants of the original pine flatwoods community that has been invaded by varying amounts of Brazilian pepper. They have areas of open lands where remnants of the original understory can still be found.

[27] **Category I** invasive species alter native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives. This definition does not rely on the economic severity or geographic range of the problem, but on the documented ecological damage caused. **Category II** invasive exotics have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species. These species may become Category I if ecological damage is demonstrated (source: http://www.fleppc.org/list/list.htm).

4.3.14.1.6 Pine Flatwoods/Disturbed Lands – 411/740

This habitat was also observed on some of the residential lots. They are larger parcels so they retain more of their original pine flatwoods characteristics and community structure. Levels of exotic species are relatively low. They have some areas of disturbance, generally along their edges.

4.3.14.2 Threatened and Endangered Species

NEPA requires an evaluation of the potential project impacts to species protected by the ESA. The USFWS and the NMFS are responsible for the administration of the ESA. In general, USFWS manages protected land and freshwater species while the NMFS manages marine and anadromous[28] species. Each agency maintains lists of protected species with their designations and protects designated critical habitat of listed species. The project area is located within consultation areas[29] for the Florida scrub jay, Audubon's crested caracara, Everglade snail kite, piping plover, and West Indian manatee. The project is within a core foraging area for the wood stork.

For completeness, this EIS also includes those species which are protected by the regulations of the State of Florida. The state list of protected animals is maintained by the FWC. Species are categorized as endangered, threatened, or species of special concern under Rule 68A-27 FAC. State listed plants are categorized as endangered, threatened, or commercially exploited, and are administered and maintained by the Florida Department of Agriculture and Consumer Services (FDACS), Division of Plant Industry (DPI), under Chapter 5B-40 FAC.

Table 4.7 contains 63 federal and state listed species that have been reported or recorded in St. Lucie County (not necessarily within the project area). The table shows the designated status, as listed by state and federal agencies and an estimate of the likelihood of occurrence within the project area. It also shows the species that were identified by the ETAT agencies. This estimate of occurrence was based on the habitat preferences and the requirements of each evaluated species (based on the literature) and whether that habitat is present in the project area. This evaluation included coordination with the FDEP, the agency with jurisdiction over the management of the AP and the SPSP, review of the NFSLR Aquatic Preserve Management Plan (2009), and coordination with USFWS, NMFS, and FWC. **Table 4.8** lists the natural habitats present in the project area and the listed species that may be present in each habitat. The table includes the federal and state listed species with a moderate to a high probability of occurring in the project area.

[28] Anadromous – species that live their adult lives in the ocean but move into freshwater streams to reproduce or spawn.

[29] A consultation area is a geographic area that contains critical habitat for species listed under the ESA. If a project is located within a designated consultation area, informal and/or formal consultation is required to ensure federal funds are not used to fund, authorize, or permit an action that would jeopardize the continued existence of any listed species or adversely modify designated critical habitats.

Table 4.7 Federal and State Listed Protected Species Reported or Recorded in St. Lucie County, Florida

Species		Potential Occurrence in Project Area[1]	Designated Status [2]		Included in ETAT Comments
Scientific Name	Common Name		Federal	State	
INSECTS					
Cyclargus thomasi bethunebakeri	Miami blue butterfly	Low	E	T	
FISHES					
Acipenser brevirostrum	Shortnose sturgeon	Low	E	E	FWC
Microphis brachyurus	Opossum pipefish	Low	SC		USFWS
Pristis pectinata	Smalltooth sawfish	Moderate	E	Prohibited [3]	USFWS
Rivulus marmoratus	Mangrove rivulus	Moderate	SC	SSC	FWC
AMPHIBIANS					
Lithobates capito	Gopher frog	High		SSC	
REPTILES					
Alligator mississippiensis	American alligator	High	T/SA	SSC	USFWS
Caretta caretta	Loggerhead sea turtle	Low	T	T	FWC
Chelonia mydas	Green sea turtle	Low	E	E	FWC
Crocodylus acutus	American crocodile	Low	T	E	
Dermochelys coriacea	Leatherback sea turtle	Low	E	E	
Drymarchon corais couperi	Eastern indigo snake	High	T	T	USFWS, FWC
Eretmochelys imbricata	Hawksbill sea turtle	Low	E	E	FWC
Gopherus polyphemus	Gopher tortoise	High		T	FWC
Lepidochelys kempii	Kemp's ridley sea turtle	Low	E	E	FWC
Pituophis melanoleucus mugitus	Florida pine snake	High		SSC	FWC
BIRDS					
Ajaia ajaja	Roseate spoonbill	Moderate		SSC	FWC
Aphoelocoma coerulescens	Florida scrub jay	Low	T	T	FWC
Aramus guarauna	Limpkin	High		SSC	FWC
Athene cunicularia floridana	Florida burrowing owl	Low		SSC	FWC
Campephilus principalis	Ivory-billed woodpecker	May be Extinct	E	E	
Charadrius melodus	Piping plover	Low	T	T	FWC
Egretta caerulea	Little blue heron	High		SSC	USFWS, FWC
Egretta rufescens	Reddish egret	High		SSC	
Egretta thula	Snowy egret	High		SSC	
Egretta tricolor	Tricolored heron	High		SSC	FWC
Eudocimus albus	White ibis	High		SSC	FWC

Table 4.7 Federal and State Listed Protected Species Reported or Recorded in St. Lucie County, Florida (continued)

Species		Potential Occurrence in Project Area [1]	Designated Status [2]		Included in ETAT Comments
Scientific Name	Common Name		Federal	State	
BIRDS					
Falco peregrinus tundrius	Arctic peregrine falcon	Moderate		Delisted	FWC
Falco sparverius paulus	Southeastern American kestrel	Moderate		T	FWC
Grus canadensis pratensis	Florida sandhill crane	Moderate		T	FWC
Haematopus palliatus	American oystercatcher	Low		SSC	FWC
Haliaeetus lecocephalus	Bald eagle	High	Delisted	Delisted	USFWS
Mycteria americana	Wood stork	High	E	E	USFWS, FWC
Pelecanus occidentalis	Brown pelican	Low	Delisted	SSC	USFWS, FWC
Picoides borealis	Red-cockaded woodpecker	Low	E	T	
Polyborus plancus audubonii	Audubon's crested caracara	Low	T	T	FWC
Rostrhamus sociabilis plumbeus	Everglade snail kite	Low	E, CH[4]	E	FWC
Rynchops niger	Black skimmer	Low		SSC	
Sterna antillarum	Least tern	Low		T	FWC
MAMMALS					
Peromyscus polionotus niveiventris	Southeastern beach mouse	Low	T	T	FWC
Podomys floridanus	Florida mouse	Moderate		SSC	FWC
Puma concolor coryi	Florida panther	Low	E	E	
Sciurus níger shermani	Sherman's fox squirrel	Low		SSC	FWC
Trichechus manatus	West Indian manatee	High	E, CH[4]	E	USFWS, FWC
PLANTS					
Asimina tetramera	Fourpetal pawpaw	Low	E	E	USFWS
Calopogon multiflorus	Many-flowered grasspink	Low		E	
Conradina grandiflora	Largeflower false rosemary	High		T	
Diceranda immaculata	Lakela's mint	Low	E	E	USFWS
Encyclia tampensis	Florida butterfly orchid	High		CE	
Halophila johnsonii	Johnson's seagrass	Not Present	T, CH[4]		USFWS
Harrisia fragrans	Fragrant prickly-apple	Low	E	E	USFWS

Table 4.7 Federal and State Listed Protected Species Reported or Recorded in St. Lucie County, Florida (continued)

Species		Potential Occurrence in Project Area [1]	Designated Status [2]		Included in ETAT Comments
Scientific Name	Common Name		Federal	State	
PLANTS					
Lechea cernua	Nodding pinweed	Low		T	
Ophioglossum palmatum	Hand fern	Moderate		E	
Opuntia stricta	Erect prickly pear	Low		T	
Peperomia humilis	Low peperomia	Low		E	
Peperomia obtusifolia	Florida peperomia	Low		E	
Polygala smallii	Tiny polygala	Low	E	E	USFWS
Schizachyrium niveum	Scrub bluestem	Low		E	
Tillandsia balbisiana	Bartram's airplant	Moderate		T	
Tillandsia fasciculata	Cardinal airplant	High		E	
Tillandsia flexuosa	Twisted airplant	Moderate		T	
Tillandsia utriculata	Giant airplant	High		E	
Tillansia variabilis	Leatherleaf airplant	Moderate		T	

[1] Potential Occurrence in Project Area is an estimate of the likelihood of occurrence for a particular species within the project area, based on existing habitats, the habitat requirements of the particular species, and/or observations of the species or its signs during field evaluations. High = observed or suitable/required habitat exists in the project area; Moderate = suitable/required habitat exists but species not observed during field investigations or may be occasionally present (fish or wildlife); Low = suitable/required habitat is not present in project area so that a given species has a low probability of occurrence in the project area.

[2] T = threatened, E = endangered, SA = similarity of appearance, SSC = species of special concern, SC = Species of Concern, CH = critical habitat, C = Candidate, CE = Commercially Exploited.

[3] The smalltooth sawfish is protected by Rule 68B-44.008 FAC as a species prohibited from harvest, possession, landing, purchase, sale, or exchange.

[4] Critical habitats for Everglade snail kite, West Indian manatee, and Johnson's seagrass are not present in the project area (although they are present in other parts of St. Lucie County).

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Table 4.8 Listed Species Potentially Present in the Project Area

Habitat (FLUCCS Code)	Listed Species Potentially Present	
	Federal	State
Pine Flatwoods (411)	EIS	LFFR, FBO, AP, EIS, APF, SAK, GT, FPS, GF, FM
Brazilian Pepper (422)		
Live Oak (427)	EIS	FBO, AP, EIS, APF, GT, FPS, GF, FM
Streams and Waterways (510)	SS, OP, AA, WIM	SS, AA, WIM
Mangrove Swamps (612)	SS, OP, MR, EIS, WS, WIM	SS, MR, WB, WS, RS, WIM
Stream and Lake Swamps (615)	EIS, BE, WS	HF, FBO, AP, EIS, BE, WB, WS
Mixed Wetland Hardwoods (617)	EIS, WS	HF, FBO, AP, EIS, WB, WS
Willow and Elder (618)	EIS, WS	EIS, WB, WS
Freshwater Marsh (641)	EIS, WS	EIS, WB, WS, RS, SC
Freshwater Marsh with Shrubs, Brush, and Vines (6417)	EIS, WS	EIS, WB, WS, SC
Disturbed (740)	EIS	EIS, WB

Federal
MR = Mangrove Rivulus
AA = American Alligator
EIS = Eastern Indigo Snake
BE = Bald Eagle
WS = Wood Stork
WIM = West Indian Manatee
SS = Smalltooth Sawfish
OP = Opossum Pipefish

State
HF = Hand Fern
LFR = Large-Flower False Rosemary
FBO = Florida Butterfly Orchid
AP = Airplants (*Tillandsia* spp.)
SS = Smalltooth Sawfish
MR = Mangrove Rivulus
AA = American Alligator
GT = Gopher Tortoise
EIS = Eastern Indigo Snake
FPS = Florida Pine Snake
GF = Gopher Frog
BE = Bald Eagle
WB = Wading Birds (herons, egrets, limpkin, white ibis)
WS = Wood Stork
RS = Roseate Spoonbill
APF = Arctic Peregrine Falcon
SAK = Southeastern American Kestrel
SC = Sandhill Crane
FM = Florida Mouse
WIM – West Indian Manatee

4.3.15 Essential Fish Habitat

The Essential Fish Habitat (EFH) provisions of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) were made final January 17, 2002 (67 FR 2343). As defined in that final rule, EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. For the purpose of interpreting the definition of EFH, "waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include aquatic areas historically used by fish, where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

The NMFS and its eight regional fisheries management councils are responsible for the management and protection of fisheries and habitat essential for the survival of managed species. The U.S. Secretary of Commerce, acting through NMFS and the South Atlantic Fisheries Management Council (SAFMC), has been delegated this authority under the provisions of the MSFCMA; Public Law 104-208. The SAFMC is responsible for the management of fish stocks and EFH within the federal 200-mile limit of the Atlantic from North Carolina through Florida. The MSFCMA, as amended by the Sustainable Fisheries Act of 1996, sets forth a number of mandates for NMFS and the SAFMC to identify and protect important marine habitat and fisheries.

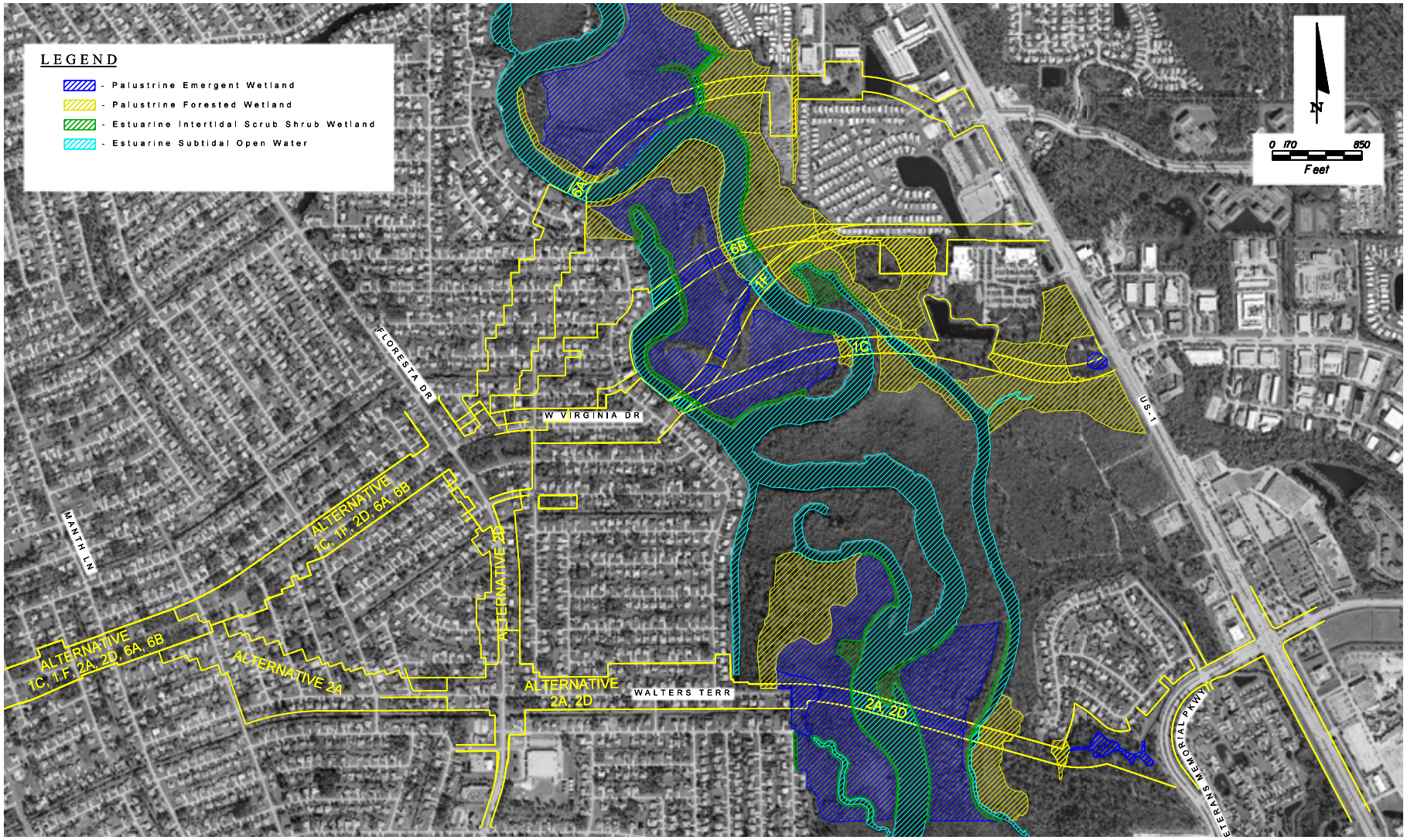
Through agency coordination, the NMFS identified the estuarine water column (containing mud and sand bottom), estuarine scrub-shrub (mangrove wetlands), and palustrine forested and emergent wetlands as present in the project area. NMFS identified these habitats designated by the SAFMC as essential fish habitat and identified several species of MSFCMA-managed fish species that occur in the project area. The species list provided by NMFS was used to prepare and evaluate the proposed project in an *Essential Fish Habitat Assessment*. The assessment of EFH was conducted in conformance with the 1996 Amendments to the MSFCMA, 50 CFR Part 600, and Part 2, Chapter 11 of the *PD&E Manual*.

The SAFMC has designated EFH for the majority of species under its jurisdiction and has identified ways to minimize adverse impacts to EFH in the Fisheries Management Plans provided within the Final Habitat Plan for the South Atlantic Region. Additionally, the SAFMC has designated several Habitat Areas of Particular Concern (HAPCs, which are subsets of EFH), which include areas that hold an especially important ecological function, are sensitive to human induced environmental degradation, are particularly vulnerable to development activities, or are particularly rare. The NMFS indicated that mangrove habitat is identified by the SAFMC as a HAPC.

Field reviews of the project area were conducted on August 30-September 1, 2003; October 6-10, 2003; December 13-15, 2004; February 16-17, 2004; September 24-25, 2008, and October 14-17, 2008. A field survey to identify and characterize EFH within the open water portions of the project area was conducted in June 2003. Absence of seagrass and benthic communities within the project area was confirmed during the field review conducted on August 30-September 1, 2003. Methods of delineating wetlands and the Estuarine Subtidal Open Water are detailed in Section 4.3.5 (Wetlands).

4.3.15.1 Existing EFH

The project area contains three types of habitats that are considered to be essential for fish species managed in the South Atlantic region: Estuarine Intertidal Scrub-Shrub Wetland (mangroves), Estuarine Subtidal Open Water, Palustrine Emergent Wetland, and Palustrine Forested Wetland (freshwater wetlands). The remainder of the habitats within the project area is uplands. Two other EFH habitats were evaluated (Seagrasses, and Oyster Reefs and Shell Banks), but these habitats were not observed and are not known to occur within the project area. EFH within the project area is shown in **Figure 4.15**. These habitats are described in Sections 4.3.5 (Wetlands) although their potential use by SAFMC-managed species is described in this section.



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ETDM No. 8247

Crosstown Parkway Extension PD&E Study and Environmental Impact Statement

Essential Fish Habitat Map

Figure 4.15

4.3.15.1.1 Estuarine Intertidal Scrub-Shrub Wetland

Estuarine intertidal scrub-shrub (mangrove) ecosystems generally have high rates of primary production and are widely recognized for providing a variety of beneficial biological and physical functions. They are known to provide important nursery, feeding, and refuge habitat for both recreationally and commercially important fisheries and their prey resources. They also play an important part in the estuarine food web by providing particulate organic detritus to the water column, providing rookery habitat for a variety of bird species, and contributing to sediment stabilization for shoreline protection. Mangroves are known to provide nursery habitat for spiny lobster, pink shrimp, mullet, tarpon, snook, and mangrove snapper. The critical value of the mangrove ecosystem to fisheries organisms is well known. Within the project area, a narrow mangrove fringe forest occurs in many areas along the channel of the NFSLR and Evans Creek. Fringing forests are considered important to fishery organisms primarily because the structure of the mangrove aerial prop-root system provides abundant food and refuge for fish and invertebrate species. Riverine mangrove forests occur along tidal rivers and creeks and are thought to be the most productive type of mangrove habitat. High primary productivity may be a result of increased tidal flushing and freshwater runoff of nutrients from adjacent terrestrial systems. Within the project area, the adjacent terrestrial systems are found inland from the NFSLR.

4.3.15.1.2 Estuarine Subtidal Water Column

Within the project area, the estuarine subtidal water column habitat can be found within the open channel of the NFSLR, Evans Creek, Hogpen Slough, South Coral Reef Waterway, and the North Coral Reef Waterway. Water column habitat is considered important to fisheries species because it serves as the medium for transport of nutrients and larvae, as well as providing an avenue for the migration of fish species from river systems to the open ocean. Additionally, physical parameters of the estuarine water column, such as salinity, dissolved oxygen, temperature, and turbidity often dictate the distribution of managed fisheries species and their prey.

The NFSLR is considered an oligohaline environment (salinity less than 8‰[30]), with typical salinities values ranging from 2 ‰ to 5 ‰. Freshwater discharges into the NFSLR and its tributaries introduce nutrients and suspended materials. Observations during the site investigations indicate that the NFSLR, Evans Creek, Hogpen Slough, South Coral Reef Waterway, and North Coral Reef Waterway have high sediment loads and the bottom sediments contain very fine silts. Several inches of silty sediments have accumulated over the river bottom.

4.3.15.1.3 Palustrine Forested and Emergent Wetlands

Palustrine forested and emergent wetlands (freshwater wetlands) are found throughout the project area within the tidal freshwater portions and in freshwater tributaries of the NFSLR drainage area. Freshwater wetland systems likely play an important role in maintaining water quality in downstream areas (in this case, the St. Lucie Estuary and Indian River Lagoon) that are used by SAFMC-managed species as nursery areas. In addition, these wetlands support EFH and the managed species dependent on that habitat through two primary avenues: provision of functional attributes, which maintain downstream EFH by binding substrates, nutrient uptake, and encouraging sediment deposition; and provision of shelter, spawning habitats for species which serve as prey for SAFMC-managed species.

[30] ‰ = parts per thousand.

4.3.15.2 Habitat Areas of Particular Concern (HAPC)

HAPCs are subsets of EFH that include areas that hold an especially important ecological function, are sensitive to human induced environmental degradation, are particularly vulnerable to development activities, or are particularly rare. The SAFMC designated HAPCs broadly to include both general habitat types (e.g., seagrass beds) and geographic areas of ecological importance (e.g., the Charleston Bump). In general, HAPCs typically include high value intertidal and estuarine habitats, offshore areas of high habitat value or vertical relief, and habitats used for migration, spawning, and rearing of fish and shellfish. Within the project area, only mangrove habitats are considered to be HAPC by the SAFMC for fishes within the Snapper-Grouper Complex. The project area does not lie within any geographically defined HAPC. HAPC information specific to SAFMC-managed species is included in the EFH evaluation.

4.3.15.3 Federally Managed Fish Species

The Fishery Management Plans (FMP) provided within the SAFMC's Final Habitat Plan for the South Atlantic Region describes EFH for the species under the agency's jurisdiction. Through the ETDM Programming Screen, the NMFS indicated that the project area is located within an area designated as EFH for two FMPs within the jurisdiction of the SAFMC: the Shrimp FMP and the Snapper-Grouper FMP. In addition, the project area is located within the geographic range for the Bluefish, which is under the jurisdiction of the Mid-Atlantic Fishery Management Council (MAFMC). In its ETDM comments, the NMFS recommended an evaluation of the Atlantic red drum. Subsequent coordination with the NMFS indicated that while Atlantic red drum can occur within the project site, it is no longer managed under the Magnuson-Stevens Act. Thus, this species is no longer managed under the EFH provisions of the Act (effective November 5, 2008) and it is not included in the EFH evaluation prepared for the EIS. These comments and NMFS coordination were used to develop the list of SAFMC species that could potentially occur within the project area. Of the 80 fish and macroinvertebrate species that are federally managed under these three FMPs, eight are known to occur, or may potentially occur, permanently or seasonally within the NFSLR and could potentially be affected by a build alternative, including the Preferred Alternative (**Table 4.9**). These species are considered likely to utilize EFH within the project area based upon their known geographical distribution, life history information, and physiological tolerances, and/or have been documented during previous fisheries collections within the NFSLR. Other fish species included within the Snapper-Grouper Management Plan that typically utilize inshore mangrove habitats as juveniles, such as the lane snapper (*Lutjanus synagris*) or white grunt (*Haemulon plumieri*), are not included in this analysis because, physiologically, they cannot tolerate the low salinities that characterize the project area.

4.3.15.3.1 Shrimp Fishery Management Plan

Six federally managed shrimp species are included in the Shrimp Fishery Management Plan. Of these, three are known to occur, or may potentially occur within the project area at some stage in their life history, including the pink shrimp, white shrimp, and brown shrimp. Each of the three species has a similar range along the Atlantic coast. All penaeid shrimp have a life cycle that requires both inshore (postlarvae and subadults) and offshore (adults and larvae) marine and estuarine habitats. Postlarval penaeid shrimp migrate to inshore habitats such as the St. Lucie River estuary in late April and early May. Estuaries are

considered nursery areas for postlarval shrimp because they offer abundant food, suitable substrate, and shelter from predators.

Table 4.9 Federally Managed Species Potentially Present within the Project Area

Common Name	Scientific Name	Comment
Shrimp FMP		
Pink shrimp	*Farfantepenaeus duorarum*	Most likely shrimp species to be present; could occur as postlarvae, juvenile, and overwintering stock
White shrimp	*Litopenaeus setiferus*	Could occur as postlarvae, juvenile, and overwintering stock
Brown shrimp	*Farfantepenaeus aztecus*	Least likely shrimp present; could occur as postlarvae, juvenile, and overwintering stock
Snapper-Grouper FMP		
Gray snapper	*Lutjanus griseus*	Common; mainly present as juveniles; mangrove inhabitant
Dog snapper	*Lutjanus jocu*	Mainly present as juveniles; associates with mangrove roots
Sheepshead	*Archosargus probatocephalus*	Common; present as juveniles and adults; mangrove inhabitant
Crevalle jack	*Caranx hippos*	Pelagic; present as juveniles and adults
Bluefish FMP		
Bluefish	*Pomatomus saltatrix*	Mostly present in late fall and winter

The project area is located within an area designated as EFH for all three penaeid shrimp species. According to the SAFMC, EFH for shrimp includes inshore nursery areas, offshore marine habitats used for spawning and growth to maturity, and all interconnecting water bodies. These habitats can include freshwater marsh and forested habitats that are at any time subject to tidal influence. These types of habitats are found in the project area where spring tides and seasonal high water can travel into the river floodplains within the project area. EFH for penaeid shrimps include the fringing and riverine mangrove forests, soft muddy bottoms associated with the NFSLR, and the water column. Based upon their typical life cycle, shrimp found within the project area are likely to be postlarvae, juveniles, or overwintering stock.

4.3.15.3.2 Snapper-Grouper Fishery Management Plan

The Snapper-Grouper Management Plan is the largest fishery management complex within the South Atlantic, containing 73 federally managed fish species within ten families. There is considerable variation in life history, habitat use, and physiological requirements for the species included in this complex. Four of the 73 species within the complex are known to occur within, or may potentially utilize, the project area, including the gray snapper, dog snapper, sheepshead, and crevalle jack.

Gray snapper occur along the Atlantic coast in marine and estuarine waters from North Carolina through Florida, and are fairly abundant within the St. Lucie estuary system. Both juvenile and adult gray snappers can tolerate a substantial range of salinity. Mangrove habitats are considered to be of high value to juvenile and adult gray snapper, while newly settled postlarval stages primarily utilize aquatic grassbed habitat. The project area is located within an area designated as EFH for gray snapper. The SAFMC defines EFH for all of the estuarine dependent and nearshore snapper-grouper species as areas of

attached macroalgae, seagrasses, estuarine emergent vegetated wetlands (saltmarshes), estuarine scrub-shrub (mangrove fringe), oyster reef and shell banks, unconsolidated bottom (soft sediments), artificial reefs, and coral reefs/live hard bottom. The SAFMC has further defined mangrove habitat as HAPC for the gray snapper. Specific portions of the project area that qualify as EFH for gray snapper include the fringing mangrove forest and muddy bottom sediments associated with the NFSLR. The NFSLR is likely to be utilized primarily by postlarval and juvenile fish; however, adult fish could occur in the project area.

Dog snapper is found throughout the South Atlantic region; however, it is rare north of Florida. Adults are found in or near offshore reef or rock rubble habitats and ledges, while the juveniles live in shallow waters such as tidal mangrove creeks, canals, and shallow protected bays, utilizing seagrass as bottom cover. Juveniles are also known to swim up coastal rivers and can tolerate nearly fresh waters. Thus, juveniles most likely occur within the project area. Young dog snapper typically settle out into the shallow grass beds and begin to feed on larger plankton and small invertebrates. The project area is located within an area designated as EFH for dog snapper. The SAFMC defines EFH for all of the estuarine dependent and nearshore snapper-grouper species as areas of attached macroalgae, seagrasses, estuarine emergent vegetated wetlands (saltmarshes), estuarine scrub-shrub (mangrove fringe), oyster reef and shell banks, unconsolidated bottom (soft sediments), artificial reefs, and coral reefs/live hard bottom. The SAFMC has further defined mangrove habitat as HAPC for the dog snapper. Specific portions of the project area that qualify as EFH for dog snapper include the fringing mangrove forest and muddy bottom sediments associated with the NFSLR. The NFSLR is likely to be utilized primarily by postlarval and juvenile fish; however, adult fish could occur in the project area.

Sheepsheads are widely distributed along the Atlantic coast, ranging from Nova Scotia in Canada through Florida, and are common within the NFSLR and the St. Lucie estuary. They prefer brackish waters, occurring as adults inshore around hard structures and mangrove roots; however, they have been known to occur in nearly fresh waters. Juveniles usually live within seagrass beds and over soft mud bottoms. Adult fish will move offshore in late winter and early spring for spawning and will later return to inshore waters. The sheepshead feeds on a variety of invertebrates, small fish, and occasional plant material. The project area is located within an area designated as EFH for sheepshead. The SAFMC defines EFH for all of the estuarine dependent and nearshore snapper-grouper species as areas of attached macroalgae, seagrasses, estuarine emergent vegetated wetlands (saltmarshes), estuarine scrub-shrub (mangrove fringe), oyster reef and shell banks, unconsolidated bottom (soft sediments), artificial reefs, and coral reefs/live hard bottom. The SAFMC has further defined mangrove habitat as HAPC for the sheepshead. Specific portions of the project area that qualify as EFH for sheepshead include the fringing mangrove forest and muddy bottom sediments associated with the NFSLR. All life stages of the sheepshead may occur within the project area.

Crevalle jacks are distributed along the entire Atlantic coast from Nova Scotia south to Florida and can occur in oceanic, estuarine, and riverine habitats. They are known to inhabit the NFSLR and the St. Lucie estuary system. Both adult and juvenile crevalle jacks are schooling fish and can occupy both fresh and saltwater environments. Adult jacks will spawn offshore typically between March and early September, and larvae will often utilize inshore estuaries as nurseries. Crevalle jacks feed on a variety of fish, shrimp, and invertebrates as adults, while juveniles normally feed on smaller fish and crustaceans. The project area is located within an area designated as EFH for crevalle jack. The SAFMC defines EFH for all of the estuarine dependent and nearshore snapper-grouper species as areas of attached macroalgae,

seagrasses, estuarine emergent vegetated wetlands (saltmarshes), estuarine scrub-shrub (mangrove fringe), oyster reef and shell banks, unconsolidated bottom (soft sediments), artificial reefs, and coral reefs/live hard bottom. The SAFMC has further defined mangrove habitat as HAPC for the crevalle jack. Specific portions of the project area that qualify as EFH for crevalle include the estuarine water column associated with the NFSLR. Additionally, the fringing mangrove forests and muddy bottom sediments along the River provide habitat for prey species of the crevalle jack. All life stages of the crevalle jack could potentially occur within the project area.

4.3.15.3.3 Bluefish Fishery Management Plan

The Bluefish Fishery Management Plan contains a single fish species, the bluefish. Bluefish are distributed along the Atlantic coast from the Maine through Florida. They are pelagic and highly migratory. During winter, large bluefish tend to remain in the Middle Atlantic Bight, while smaller fish move farther south with some fish wintering off the coast of Florida. As water temperatures increase, the spring migration north begins and spawning occurs in the South Atlantic Bight at this time. By summer, bluefish move north into the Middle Atlantic Bight, although some medium size fish may remain off Florida. Estuaries are considered to be important habitat for both adult and juveniles, which have been documented in estuaries where salinity was less than 10‰. Bluefish are voracious predators, feeding primarily on squid, menhaden, and small fish. The project area is located within an area designated as EFH for bluefish. The MAFMC defines inshore EFH for bluefish as all of the following habitats: pelagic waters over the Continental Shelf (eggs, larvae, juveniles, and adults); the "slope sea" and Gulf Stream between latitudes 29˚ 00 and 40˚ 00 (larvae and juveniles); and all major estuaries between Penobscot Bay, Maine and St. Johns River, Florida (juveniles and adults). The project area does not include EFH for bluefish, although it is possible that adults and juveniles of this species utilize the NFSLR during the fall and winter.

4.3.15.4 Diadromous Species

Diadromous fish are fish species that migrate between freshwater and saltwater. The migration patterns differ for each species and have seasonal and lifecycle variations. There are three types of diadromous fish, those that spend most of their life in freshwaters and migrate to saltwater to spawn (catadromous), those that mainly live in saltwater that return to freshwater lakes and rivers to reproduce (anadromous), and those that migrate between estuaries and coastal rivers that can reproduce in fresh or marine waters (amphidromous). The MSFCMA requires the various fishery management councils to comment on projects proposed for federal authorization which have the potential to affect EFH for diadromous species. The SAFMC has defined the eight federally-managed diadromous species as those that inhabit the U.S. Exclusive Economic Zone for any portion of their life cycle (SAFMC 1998a). Of these eight species, two are known to occur, or may potentially occur, within the project area. These include the American eel and opossum pipefish.

The American eel is a catadromous species that is distributed throughout the South Atlantic region, occurring in most coastal rivers, freshwater streams, and lakes. It is a frequent inhabitant of the freshwater tidal creeks within the Indian River Lagoon system. The adults migrate from these inshore habitats to the open ocean to spawn in late autumn through early spring. Young eels mature within estuaries and freshwater tidal rivers. Eels feed on insects, worms, mollusks, crayfish and other crustaceans, frogs, and fish. The SAFMC has yet to define specific EFH requirements for the American eel. Eels prefer soft bottom sediments, which burrowing eels may use for shelter, and have broad tolerances for salinity,

temperature, and dissolved oxygen. The muddy bottom and favorable water quality parameters associated with the NFSLR likely make it suitable habitat for the more advanced life stages of the American eel.

The opossum pipefish is a diadromous species federally listed as a species of concern[31]. It spawns in freshwater and the only known reproducing populations within the United States are found within the St. Lucie, Sebastian, and Loxahatchee Rivers. Larvae are released from the male's pouch and float downstream where they metamorphose into juveniles. After metamorphosis, they then spend an unknown period of time in *Sargassum* communities in the open ocean. Juveniles return to freshwater where they mature into adults. Recruitment to these rivers occurs during the low flow dry season and larvae are released in the high flow wet season. Juveniles mature into adults in freshwater emergent vegetation, especially grasses (*Panicum* spp.) and knotweeds (*Polygonum* spp.). They are ambush predators, using the dense vegetation as cover. Larval and migrating juveniles have been collected with plankton nets from Hells Gate (at the lower end of the St. Lucie River) to the Prima Vista Boulevard Bridge. They were commonly observed and collected within the grass/knotweed habitats formerly present at Rivergate Park, until these habitats were replaced by riprap or removed by herbicides. The elimination of pipefish spawning habitat is thought to be a major factor in reduced population numbers. The specific freshwater emergent marsh habitat that the opossum pipefish requires is not present in the brackish-water habitats in the project area. This has been confirmed through field investigations of each of the river crossing alternatives. However, it is known that the species migrates through the project area during its upstream and downstream migrations. Thus, it is highly likely that it could be found passing through the project area during these times.

4.3.15.5 State Regulated Species

Within Florida, the FWC is charged with the protection of marine fishery resources in state waters, the protection of threatened and endangered marine species, and the development of regulations governing the taking and use of the state's recreational and commercial marine fishery resources (Chapter 373 FS Saltwater Fisheries). Chapter 68B FAC lists all state regulations for saltwater managed species. **Table 4.10** provides a list of state regulated species that are known to, or may potentially utilize at some point in their life history, the project area.

4.3.16 Farmlands

The Farmland Protection Policy Act (FPPA) of 1981 was enacted to minimize the extent to which federal programs contribute to unnecessary and irreversible conversion of farmland to non-agricultural uses. Prime farmland is defined as land that possesses the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, without intolerable soil erosion. Unique farmland is

[31] A "Species of Concern" is a species for which the National Marine Fisheries Service (NMFS) has concern or uncertainty about its status. They are not listed or protected under the Endangered Species Act (ESA). The use of the term does not necessarily mean that the species will eventually be proposed for listing as a threatened or endangered species (http://www.nmfs.noaa.gov/pr/species/concern/, accessed 8/30/12).

considered land other than prime farmland that is used for the production of specific high-value food and fiber crops. Consideration of farmlands was evaluated in accordance with Part 2, Chapter 28 of the *PD&E Manual*.

Table 4.10 State Regulated Recreational and Commercial Fishes Potentially Present within the Project Area

Common Name	Scientific Name	FAC Chapter
Bay whiff	*Citharichthys arctifrons*	68B-48 (Flounder)
Blue crab	*Callinectes sapidus*	68B-45
Brown shrimp	*Farfantepenaeus aztecus*	68B-31 (Shrimp)
Bull shark	*Carcharinus leucas*	68B-44 (Shark)
Gray snapper	*Lutjanus griseus*	68B-14 (Reef Fish)
Herrings and Shad	*Brevoortia* sp.*; Dorosoma* sp.	68B-52 (Shad and River Herring)
Pink shrimp	*Farfantepenaeus duorarum*	68B-31 (Shrimp)
Red drum	*Sciaenops ocellata*	68B-22
Sheepshead	*Archosargus probatocephalus*	68B-48
Snook	*Centropomus undecimalis*	68B-21
Striped mullet	*Mugil cephalus*	68B-39 (Mullet)
Tarpon	*Megalops atlanticus*	68B-32
Weakfish	*Cynoscion regalis*	68B-47
White mullet	*Mugil curema*	68B-36 (Mullet)
White shrimp	*Litopenaeus setiferus*	68B-31 (Shrimp)

A review of existing land uses showed no FPPA-regulated farmland in the project area. In addition, field surveys did not identify any actively farmed property. The NRCS has determined that the project area, which is located in the urbanized area of the City, does not meet the definition of farmland as defined in 7 CFR 658. Therefore, the provisions of the FPPA of 1981 do not apply to this project.[32]

4.3.17 Scenic Highways

NEPA requires that federal agencies consider the effect of federal actions on the social, economic, natural aesthetic and cultural environment, man-made features such as roadways and bridges. Natural, physical, visual, and cultural factors make up the features of a scenic highway. State regulations also mandate that state and local agencies provide opportunities for preserving, maintaining, protecting, and enhancing the intrinsic resources of scenic corridors [Section 334.044 (25) FS; Section 336.045 (1) FS; Section 335.045(6) FS; Section 339.155 (2)(k) FS]. Consideration of scenic highways was evaluated in accordance with Part 2; Chapter 29 of the *PD&E Manual*.

[32] Letter from NRCS, dated April 9, 2009 (**Appendix A).**

Certain highways have been specifically designated as scenic highways to preserve the natural beauty and scenic character of Florida. Each type of designation has different levels of protection, preservation, and public involvement. In St. Lucie County, Indian River Drive and S.R. A1A (Ocean Drive) on Hutchinson Island have been designated as the *Indian River Lagoon-Treasure Coast Scenic Highway*. Neither of these roads is located within or near the project area.

4.3.18 Navigation

The NFSLR is a navigable water of the United States as defined in 33 CFR Part 2 and, therefore, falls under the jurisdiction of the U.S. Coast Guard (USCG) to provide for the reasonable needs of navigation. Within the study limits, the North Coral Reef Waterway, South Coral Reef Waterway, and Evans Creek branch off from the NFSLR and are also navigable waters falling under the jurisdiction of the USCG. The USCG has indicated that a USCG Permit will be required for a new bridge crossing(s) for all build alternatives, including the Preferred Alternative.

Between the 1920s and 1940s, the NFSLR was extensively dredged, channelized, and straightened for flood control and navigation. As a result of the dredging, a significant portion of the River's potential to naturally filter nutrients and sediments was lost, and over time, the channelization process has contributed to the deposition of large muck deposits downstream at the junction of the north and south forks of the St. Lucie River. In an effort to restore some of the natural function to the system, FDEP, along with several other regional and local government agencies, began conducting hydrologic restoration projects in 2002 at various sites along the River.

Overall, the NFSLR is 16 river miles in length. Bathymetry information can be found on the FDEP website[33], which indicates the NFSLR ranges in depth from six to 12 feet. Within the study limits, the width of the NFSLR varies significantly along its length. Measured at the locations of the alternative river crossings, the width of the NFSLR main channel ranges from approximately 170 to 640 feet at mean high water (MHW). The widths of the tributaries vary from as little as 40 feet (MHW) at an unnamed tributary of the NFSLR to 295 feet (MHW) at North Coral Reef Waterway [**Table 6.4** in Section 6.0 (Section 4(f) Evaluation)].

Navigational uses of the NFSLR are for recreational activities and for a commercial blue crab fishery. Measureable commercial/industrial shipping activity along the NFSLR does not exist and is not feasible along the narrow, winding course of its upstream reaches. The recreational navigation uses along the NFSLR include canoeing, kayaking, motor boating, and sailing. Additionally, eco-tour operations along the NFSLR provide pontoon boat trips to educate residents and visitors about the NFSLR. The NFSLR is a manatee protection zone. Therefore, there are several manatee and other slow speed zones within the River.

The public can access the NFSLR from four public boat ramps along the AP. In order of upstream (north) to downstream (south), these access points are:

- White City Park – 1801 West Midway Road, Fort Pierce;
- River Park Marina – 500 East Prima Vista Boulevard;

[33] http://www.dep.state.fl.us/coastal/sites/northfork/pub/NF_Map10_Bathymetry.pdf, accessed 8/30/12.

- Veterans' Memorial Park – 2100 SE Midport Road, Port St. Lucie; and
- Club Med – Sandpiper – 3500 SE Morningside Boulevard, Port St. Lucie.

The location of these River access points are depicted in **Figure 6.2** of Section 6.0 (Section 4(f) Evaluation) of this document. With the exception of Club Med - Sandpiper, all of the public access points are associated with adjacent public lands and are managed by local and state agencies. All of the boat ramps are located outside of the project area.

In addition to the boat ramps, there are several canoe stopovers[34] that provide access to the NFSLR. One of those public access points is provided at the Halpatiokee Canoe and Nature Trail, where a canoe/kayak launch/nature trail is located along the western side of U.S. 1, north of Village Green Drive. This site is part of the Savannas Preserve State Park and is maintained by FDEP. This is the only recognized canoe stopover within the project area and it is located on Evans Creek.

In addition to the public access boat ramps, numerous privately-owned residential docks are located along the NFSLR, including many within the project area along the North Coral Reef Waterway, the South Coral Reef Waterway, and the NFSLR. According to the FDEP website[35], as of June 2007, there were 393 private docking facilities within the NFSLR Aquatic Preserve. This includes the NFSLR and its tributaries both within and outside of the project area. Most of these are private residential single-family docks with several private residential multi-slip docks.

The vertical clearances of the existing fixed bridges to the north and south of the study area, govern the height of the watercraft that can pass through the study area, especially the mast height of sailboats. According to the USCG publication titled, *Bridges Over Navigable Waters of the United States - Atlantic Coast* (**Appendix A**), the clearance of the Prima Vista Boulevard Bridge (upstream) is 13 feet above MHW. The vertical clearance of the Port St. Lucie Boulevard Bridge (downstream) is 18.6 feet above MHW.

The USCG has provided clearance requirements and has stated that minimum clearances for the main channel of the NFSLR and the North Coral Reef Waterway must meet or exceed those of the downstream (and controlling) elevations of the Port St. Lucie Boulevard Bridge. Those clearances are 18.6 feet vertically and 75.5 feet horizontally. Evans Creek has been given advance approval.[36,37] The lowest part of the superstructure must be above the 100-year flood height.

[34] Small docks or landings providing rest areas for canoeists and kayakers.

[35] Internet: www.dep.state.fl.us/coastal/sites/northfork/management/issues/public.htm; accessed 1/3/2012.

[36] U.S. Coast Guard has given advance approval to the location and plans of bridges to be constructed across reaches of waterways navigable-in-law, but not actually navigated other than small motorboats, rowboats, and canoes. In such cases, the clearances provided for high water stages will be considered adequate to meet the reasonable needs of navigation. The term "small motorboats" means rowboats, canoes, and other similar craft with outboard motors. It does not include sailing or cabin cruiser craft. The term is used to distinguish such craft from the definition of "motorboat" in the Motorboat Act of June 25, 1940 (46 U.S.C. 526), which includes craft up to 65 feet in length.

[37] Letter from USCG, dated July 27, 2012 (**Appendix A**).